Data Projector

PROJECTOR

Service Manual

EMP-S3

EPSON

INTRODUCTION

This Service Manual describes the hardware information necessary for troubleshooting and field service of the EMP-S3 DATA PROJECTOR.
Before starting service on this unit, always check the EPSON website for additional up-to date service information provided in Technical Information Bulletins.

HOW TO USE THE SERVICE MANUAL

Before you start the maintenance service, read the SAFETY INSTRUCTIONS carefully.
The contents are as follows:

- Safety Instructions: Operator Safety, Maintaining the projector in good condition
- Chapter 1: PRODUCT SPECIFICATION (Part name, System function, Specification, etc.)
- Chapter 2: THEORY OF OPERATION (Hardware, Internal connection, Function of units, etc.)
- Chapter 3: TROUBLE SHOOTING
- Chapter 4: DISASSEMBLY & ASSEMBLY (Procedures to disassemble the main unit)
- Chapter 5: APPENDIX (AS (After Service) menu)

VCCI RADIO FREQUENCY INTERFERENCE SELF RESTRICTION

This product is Type 1 information equipment and uses radio frequency energy. It fully complies with the rules of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). Accordingly, if this product is used in a residential area or place situated close to residential area, it may interfere with reception of televisions or radios in the neighborhood. Follow the instruction manual to avoid mishandling of this product.

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PRECAUTIONS

Some procedures require specific precautions that must be followed, and those will be noted throughout this manual. Note the following precaution definitions:

WARNING

WARNING	Procedures which, if not strictly observed, could result in personal injury are described under the heading **WARNING**

CAUTION

CAUTION	**CAUTION** signals a precaution which, if ignored, could result in damage to equipment.

REASSEMBLY

Reassembly	If assembly needs special attention or the procedure is different from the reversed disassembly procedure, the correct procedure is described under the heading **REASSEMBLY**.

CHECK POINT

CHECK POINT	Important tips for procedures are described under the heading **CHECK POINT.**

2005   SEIKO EPSON CORPORATION

Manual Revision History

History	Date	Detail of change
Rev.A	2005.3.11	First Release
Rev.B	2006.5.9	Change in P.4-15.

Service memo

Make a note here of important technical information from Technical Information bulletins.

SAFETY INSTRUCTIONS

1. MAINTAINING OPERATOR SAFETY

1. PREVENTING ELECTRIC SHOCKS
   - Turn off the power switch and disconnect the power cord from the AC outlet before carrying out any disassembly and assembly work on this projector.
   - If power needs to be supplied to the projector while the cover is removed (such as when making adjustments), take off any metallic objects such as wristwatches, shirt cuff buttons, rings and tie pins which may pose the danger of coming into contact with the projector.

2. PREVENTING INJURY
   - Do not touch the lamp assy and the area around it with bare hands immediately after turning the power off, or even after cool-down period is completed since the lamp and the area around it may still remain hot.
   - When removing the cover in order to carry out adjustments while power is being supplied to the projector, be careful not to touch the fans (intake and exhaust).
   - Always wear gloves when disassembling and reassembling the projector in order to avoid injury from metallic parts with sharp edges.
   - Do not look directly into the projector's lens while power is being supplied to the projector, otherwise your eyes may be injured.

3. PREVENTING ACCIDENTS
   - Place the projector on a stable, level surface when carrying out any repair or adjustment work, to prevent the projector and its components from slipping and falling down. Furthermore, do not place any tools or projector components on top of or underneath the projector.
   - Avoid working on the projector in places where other people might receive injuries from touching the projector while it is in a state of disassembly. Furthermore, do not leave the projector unattended in the workplace at such times.
   - When turning on the projector's power, always use the accessory power cord to connect the projector to the power supply, and always make sure that the power supply is properly grounded.

2. MAINTAINING THE PROJECTOR IN GOOD CONDITION

1. PREVENTING STATIC ELECTRICAL DAMAGE
   - When disassembling and assembling the projector, always use a grounding strap and a grounding mat. Furthermore, when replacing electrical circuit components (such as circuit boards and optical engine), bring the static-proof bag containing the new parts into contact with a metallic section of the projector before taking out the component from the static-proof bag.

2. USE OF GENUINE PARTS
   - When replacing the structural components inside the projector (including the lamp assy), use only replacement parts supplied by EPSON and listed in the projector's Parts List.
   - Use the accessory power cord and interface cable provided with the projector.

3. SAFETY TESTING
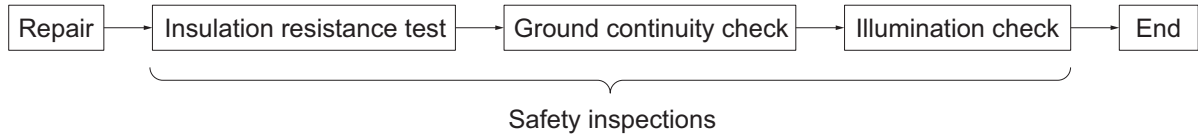   The following tests should be carried out on repair parts used in the LCP.
   Note: These are simplified tests that can be carried out at a repair centre that is not equipped with full safety testing equipment.

☐ Test items
   1). Insulation resistance test
   2). Ground continuity check
   3). Illumination check

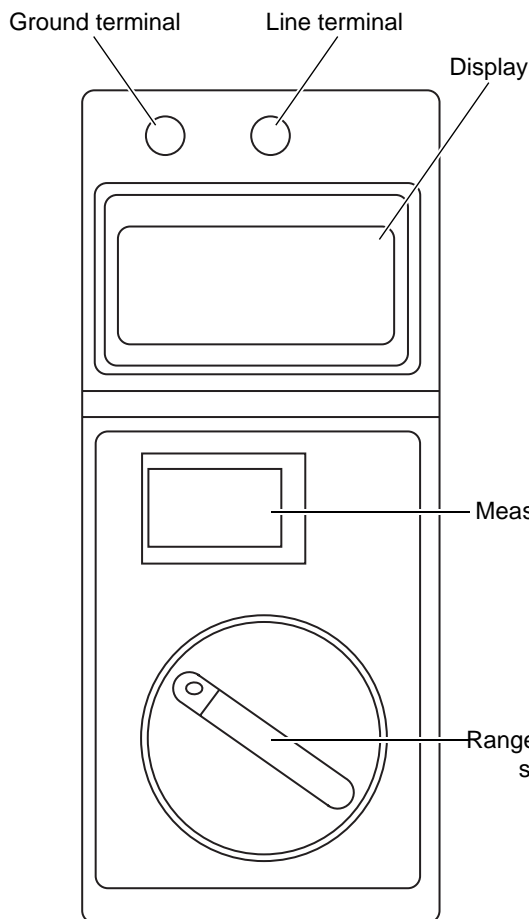☐ Testing procedure

Carry out testing in the order given below.

```
┌────────┐   ┌──────────────────────────┐   ┌────────────────────────┐   ┌────────────────────┐   ┌──────┐
│ Repair │ → │ Insulation resistance test│ → │ Ground continuity check│ → │ Illumination check │ → │ End  │
└────────┘   └──────────────────────────┘   └────────────────────────┘   └────────────────────┘   └──────┘
```

Safety inspections

☐ Testing methods

1). Insulation resistance test

- Testing apparatus: Insulation ohmmeter (Rating: 500 V/100 MΩ)

Check Item	Tool	Standard
Insulation resistance check	Insulation ohmmeter	Insulation resistance should be 10 MΩ or more.

- Insulation ohmmeter settings

1. Set the range selection switch to 500 V.
2. Connect the black lead wire to the ground terminal.
3. Connect the red lead wire to the line terminal.
4. Connect the black lead wire (crocodile clip) to c in order to measure the insulation resistance (1) (between a and c) in the diagram below.
5. Next, insert the probe of the red lead wire into a.
6. Set the measure switch to LOCK, and then measure the insulation resistance after 1 minute.
7. Check that the insulation resistance after 1 minute is 10 MΩ or more.
8. Next, measure the insulation resistance at (2) (between b and c) in the diagram below in the same way as for (1).
9. Check that the insulation resistance at (2) after 1 minute is 10 MΩ or more.

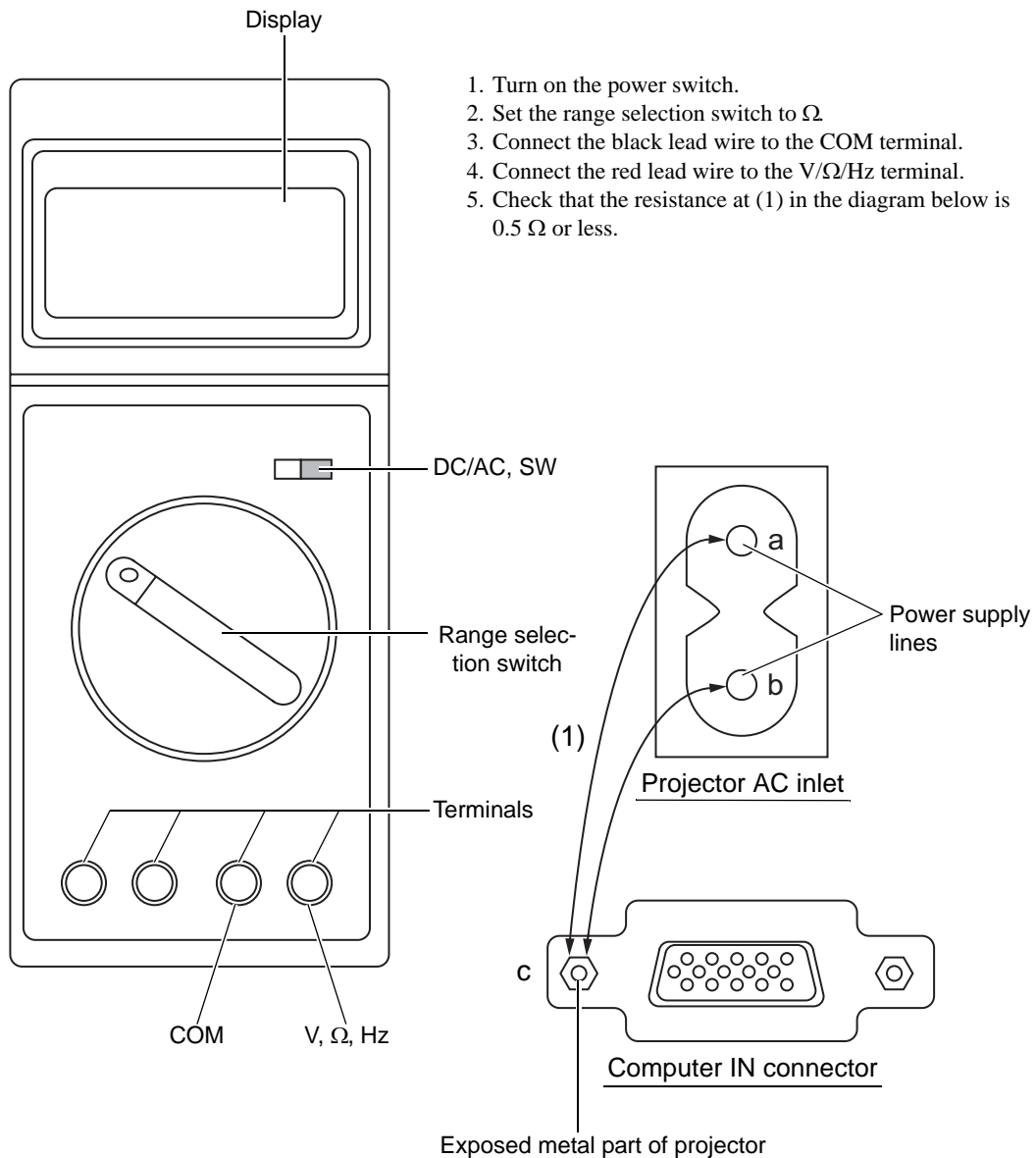Ground terminal   Line terminal
                              Display

Measure switch

Range selection switch

⚠ **! Caution**

Because high voltage (500 V) is present, do not touch the probe during testing.

a

b

Power supply lines

Projector AC inlet

(1)   (2)

c

Computer IN connector

Exposed metal part of projector
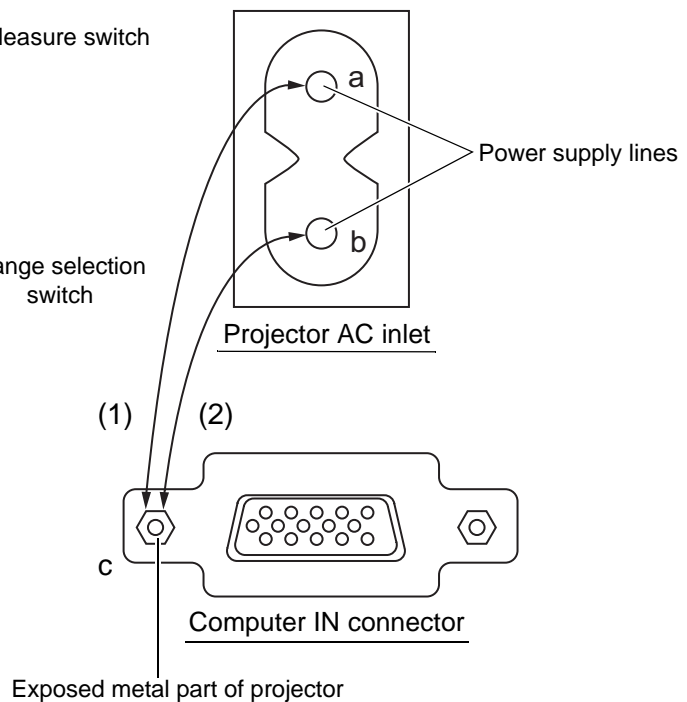
2). Ground continuity check
- Testing apparatus: Multimeter (with sensitivity down to 0.1 Ω)

Check Item	Tool	Standard
Ground continuity check	Multimeter	Should be no resistance (0.5 Ω or less)

- Multimeter settings

1. Turn on the power switch.
2. Set the range selection switch to Ω.
3. Connect the black lead wire to the COM terminal.
4. Connect the red lead wire to the V/Ω/Hz terminal.
5. Check that the resistance at (1) in the diagram below is 0.5 Ω or less.

3). Illumination check
- Test conditions: Input a PC or video signal to the projector and check the illumination for about 5 minutes.
- Evaluation: Projector should operate normally with no smoke or fire.

□ Other
- Check that the connectors at both ends of the power cord are not dirty or bent, and clean them if they are dirty. Furthermore, if there is any noticeable discoloration on the power cord, it should be replaced.
- When connecting the connector cables and interface cables inside the projector, make sure that the cable connectors are pushed on as far as they will go.
- To prevent problems caused by dirt getting into the optical system, always disassemble and assemble the projector in an area which is free from floating dust.
- When disconnecting the FPC cable from the CN903 of the MA board assembly, release the connector locks. To release the connector lock, push up both ends of the connector simultaneously with tweezers.
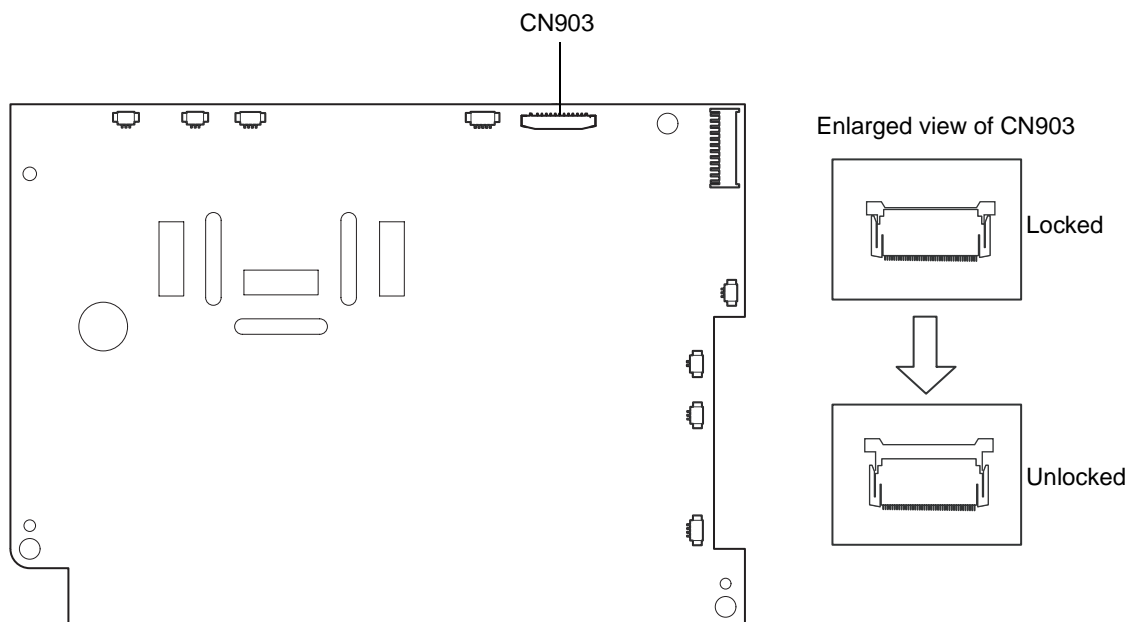
- When disconnecting the three FPC cables for the light valves from their connectors, release the connector locks first.
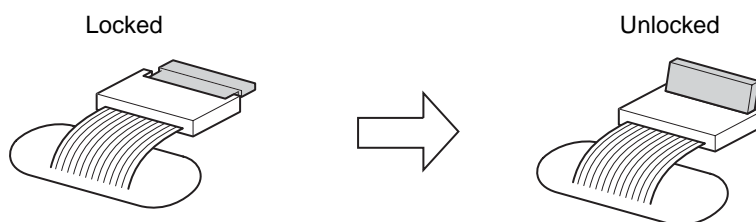
3. NECESSARY REQUIREMENTS FOR SERVICE TECHNICIANS

Service technicians who carry out repairs and servicing work on the EMP-S3 must possess the following knowledge and abilities:
- The service technician must have read and fully understood the contents of the User's Guide, especially projector operation.
- The service technician must have a fundamental knowledge of working with electricity, including safety procedures, knowledge regarding electrical circuits, and knowledge regarding static electricity.

4. Others

- Any questions regarding repairs and service to this projector (such as supply of parts and the contents of this Service Manual) should be directed to EPSON at the address below. Furthermore, information regarding matters such as technical changes to the projector are released when necessary in the form of Technical Information bulletins, and these should be referred to also.

SEIKO EPSON CORPORATION
ADDRESS 4897 OH-AZA, SIMAUCHI, MATSUMOTO-SHI,
                    NAGANO-KEN, 390-8640 JAPAN
TEL.   81-263-48-5437
FAX.   81-263-48-5680
SECTION   VD.CS Quality Assurance Department

Chapter 1 Product Specifications

Chapter 2 Theory of Operation

Chapter 3 Troubleshooting

Chapter 4 Disassembly/Assembly

Chapter 5 Appendix

Chapter 1   Product Specifications

1.1 Product Features

The EMP-S3 is a B4-sized portable projector that is the smallest and lightest in its class. It offers high-quality color images allowing you to enlarge and project from personal computers, video equipment (VCRs, video cameras, video disc players, etc.).

1.1.1 Features of the Projector

Compact and lightweight

- B4-sized dimensions: 246 mm x 327 mm x 98 mm (D x W x H)
- 2.5kg weight

Brilliant, attractive images

The Projector employs a high-luminance lamp assembly (UHE-135W) and an optical block that allows the S3 to project images at a brightness of up to 1600 lm.

Full-color, high-resolution capabilities

The projector has three transparent LCD panels (R, G and B), each with 480,000 pixels which can project images at resolution of up to 800 x 600 dots (approximately 1.677 billion pixels).

Quiet operation

Operating noise at low brightness is only 28 dB.

Brief cool-down period (Instant-Off function)

Cool-down is completed in just a few seconds when turning the projector power off.

Easy to Operate

The accessory remote control can be used for operations such as Freeze, E-Zoom, Effect, A/V Mute, User's Logo Capturing and Resize functions.

Direct Power-ON

The projector is automatically turned on when an AC connector is plugged in.

Password Protect function

Activating the Password Protection Function prevents unauthorized persons from using the projector.

Vertical keystone correction

This function allows users to correct vertical image distortion easily.

Color mode function

The images can be projected at the optimum image quality for the projecting environment by selecting the image source and environment mode from one of seven preset settings.
- Photo
- Presentation
- Theatre
- Game
- sRGB
- Black Board
- Sports

Automatic Incoming Signal Detection Function

The **Search** button on the remote control and the **Source Search** button on the control panel allow the user to switch between images from different pieces of equipment connected to the projector each time either one of the two buttons is pressed. While the projector is detecting a source, it displays **the Search in Progress** screen to show the user which source being detected.

```
[Source Search]
                              Signal Status
       Computer               OFF
       S-Video                ON
       Video

·Input an image signal.
·Press [   ] to select the source.

[   ]:Select [Enter]:Enter                    [Esc]:Exit
```
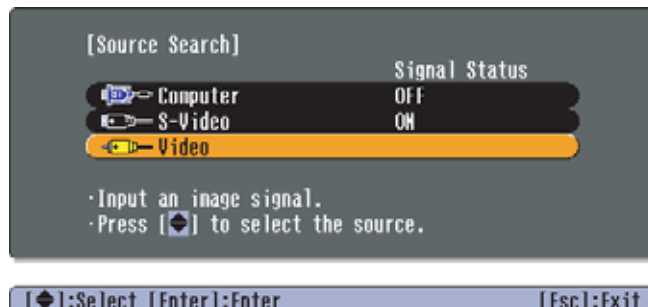
Instant-Off Function

This lets the user to turn the projector off quickly by reducing the cool-down period. When the **Power** button on the remote control or the control panel is pressed, the lamp is turned off and then the end of power-off process is indicated by two beeps. The fans stops soon after the beep regardless of the internal temperature.

Fan Speed Switch Function

When using the projector at high altitude (higher than 2,000 meters above sea-level), the fan speed should be increased to cool the projector efficiently and extend the lamp life since air density is low at high altitude. Select **High** for the **Fan Speed** in the **Extended Menu** to increase the fan speed.

Image Shift Function

This allows the user to adjust the image position without moving the projector. The image retains its original aspect ratio after it is moved. This function is useful when it is difficult to set the projector straight in front of the screen.
After correcting keystone distortion and adjusting the zoom, a screen to select the image position is displayed. The user can select one of nine image position settings on the screen.

1.2 Components, Connectors and Switches

1.2.1 External Components

Lamp cover

Security lock (🔒)

Control panel

Focus ring

Remote control light-receiving area

Air exhaust vent

Front adjustable foot

Foot adjust lever

Lens cover
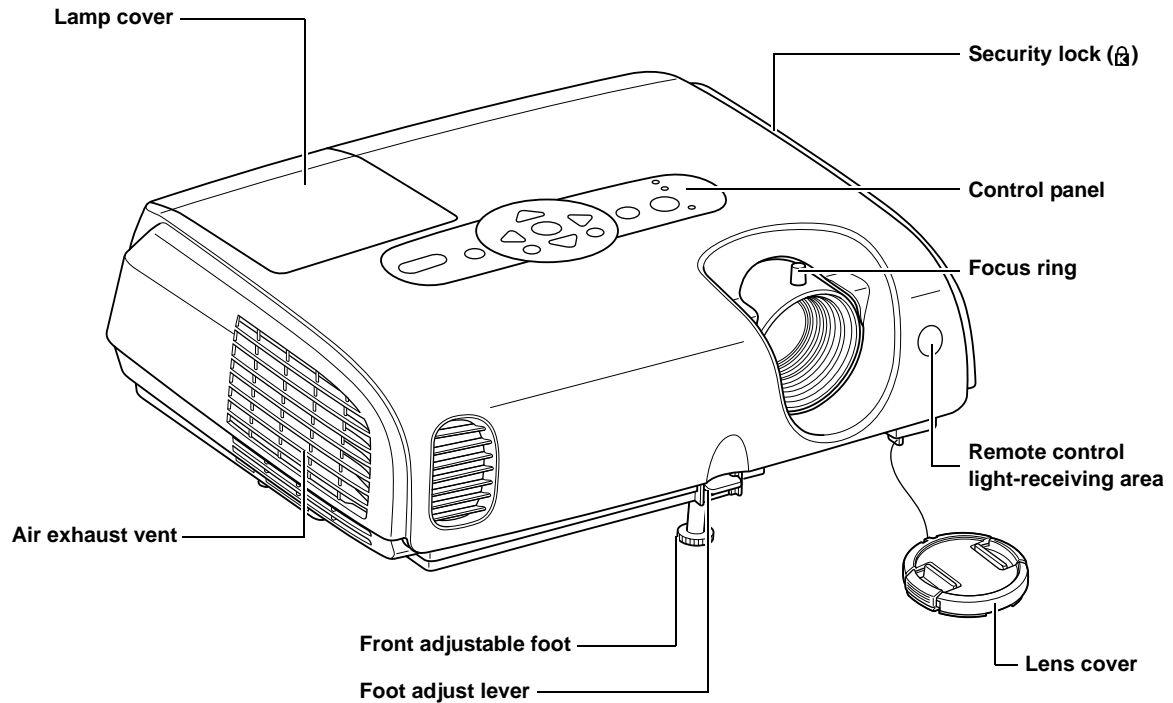
Figure 1-1. Main Unit Front

Foot adjust lever

Front adjustable foot

Lens cover tether attachment point

Air filter (air intake vent)

Ceiling mount attachment points (3 points)
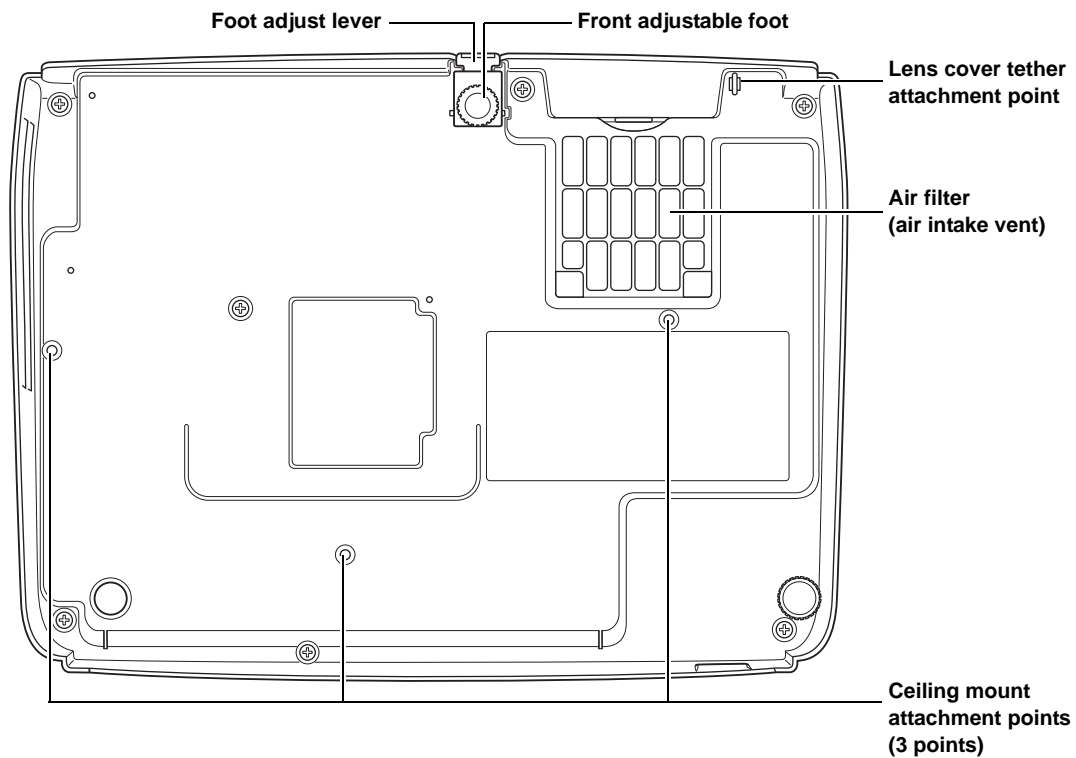
Figure 1-2. Main Unit Bottom

Computer port

Monitor Out port

S-Video port

USB port

Video port

Remote control light-receiving area

Power inlet

Speaker

Rear adjustable foot

Audio input
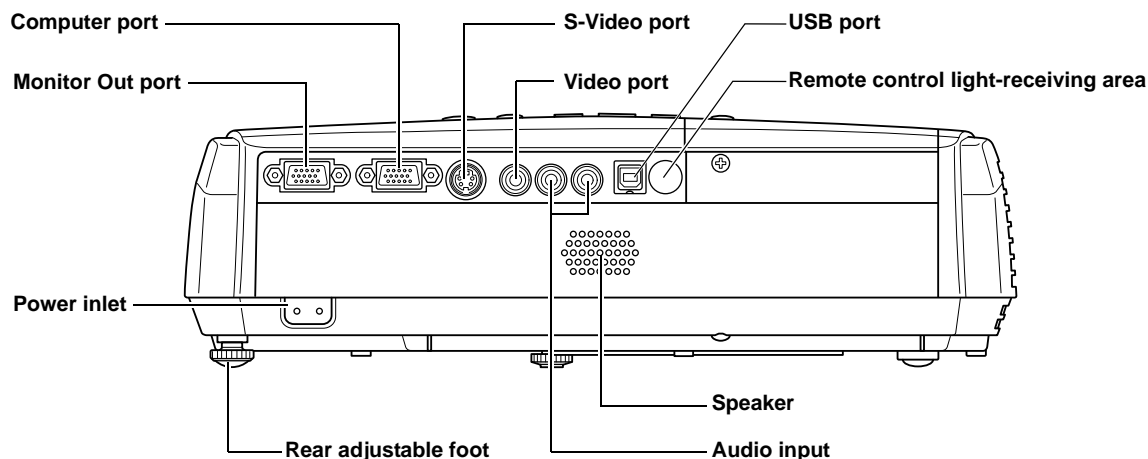
Figure 1-3. Input and Output Connectors

[Menu] button
Displays and closes the configuration menu.

[Power] button
Turns the projector power on or off.

Indicators
The colour of the indicators and whether they are flashing or lit shows the state of this projector.

[Enter] button
Automatically adjusts analogue RGB images from computers and RGB video images to the optimum images. If a configuration menu or help screen is displayed, it accepts and enters the current selection.

[Esc] button
Stops the current function.
Displays the previous screen or menu while viewing a configuration menu.

[Help] button
Displays and closes the help, which shows solutions if a problem occurs.

Power

Source Search

Menu

Enter

Esc

Help

Wide

Tele

Lamp

Temp

[Source Search] button
The input source is automatically searched for in the following order, and the input image from the connected equipment is projected.

Computer port

S-Video port

Video port

[Wide] [Tele] button
Adjusts the image size. If a configuration menu or help screen is displayed, it selects menu items and setting values.

[⬈⬙] [⬙⬉]button
Press to correct keystone distortion.
If a configuration menu or help screen is displayed, it selects menu items and setting values.

Figure 1-4. Control Panel

1.2.2 Internal Components

Control Panel

Upper case unit

MA Board

Lamp Assy.

Optical Engine

TH Board

Lamp lid detection switch

Safety Switch

Exhaust Fan

Power Supply Fan

Power Supply Unit

Speaker IF unit

Intake Fan 1 Intake Fan 2

Figure 1-5. Major Internal Components

1.2.3 Remote Control

[E-Zoom] button(⊕) (⊖)

(⊕) Enlarges parts of images without changing the size of the projection area.

(⊖) Reduces the part of images that have been enlarged using the (⊕) button.

[Page down][Page up] buttons
When using the remote control as a wireless mouse, press these buttons to scroll back and forth through pages in a PowerPoint file.

[Enter] button
Accepts a menu or help item or displays the next screen or menu when viewing a configuration menu or help menu.
Acts as a mouse left-click when using the wireless mouse function.

[A/V Mute] button
The audio and video are turned on or off each time the button is pressed.

[Pointer] button
Press to indicate part of an image being projected as part of a presentation.

[Computer] button
[S-Video] button
[Video] button
Switches to images from the corresponding port.

[Auto] button
Automatically adjusts and optimises analogue RGB computer video signals.

Numeric buttons
Use these buttons to enter a password when using Password Protect.

[Search] button
The next input source is searched for automatically in the following order and the image input from the connected equipment is projected each time this button is pressed.

- Computer port
- S-Video port
- Video port
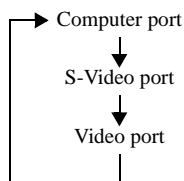
Remote control light-emitting area
Outputs remote control signals.

[Power] button
Turns the projector power on and off.

[◎] button
When a configuration menu or help menu is displayed, the button selects menu items and setting values.
When the wireless mouse function is activated, tilting this button moves the pointer in the direction of tilt.
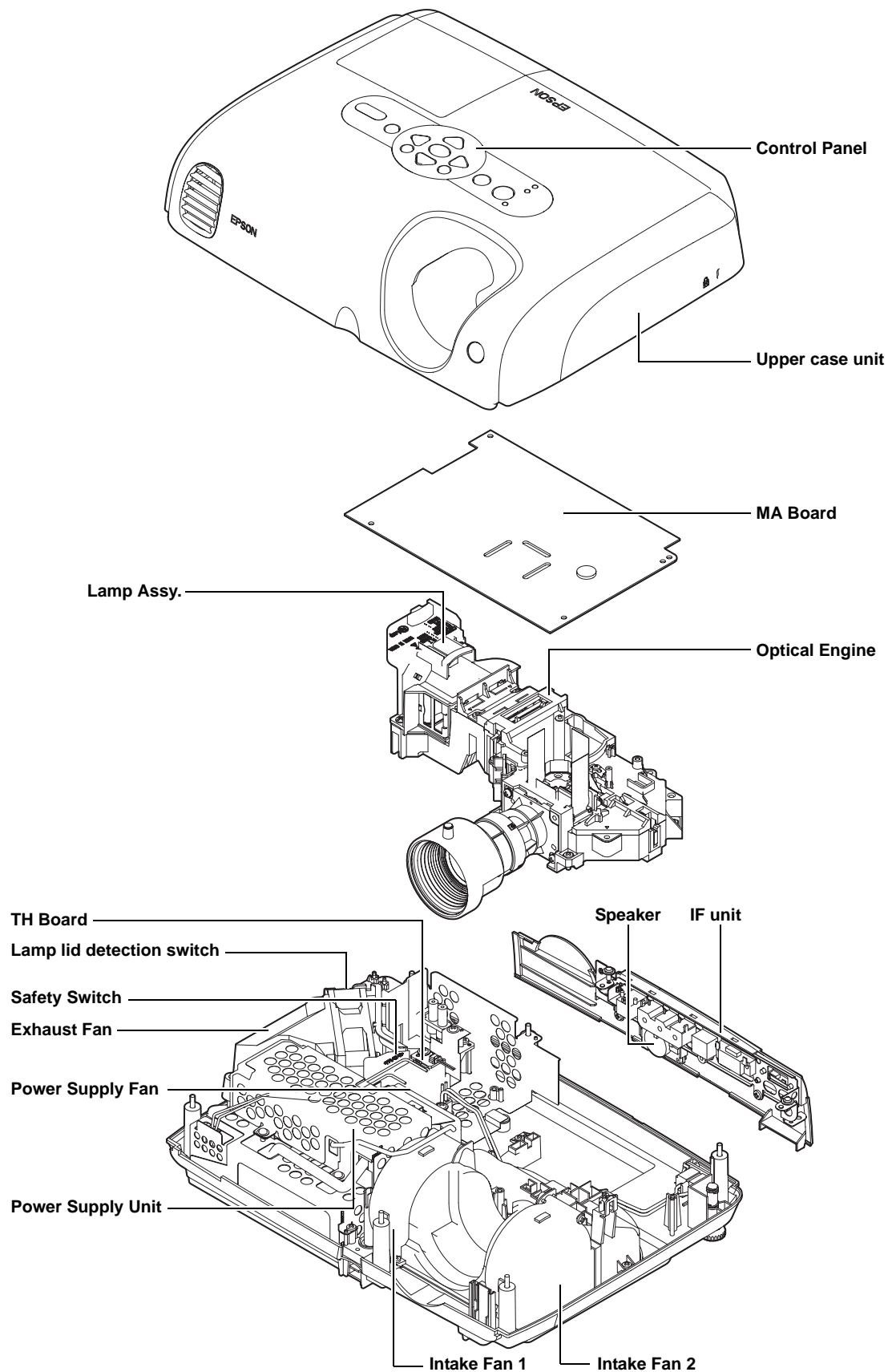
[Esc] button
Stops the current function.
Displays the previous screen or menu while viewing a configuration menu.
Acts as a mouse right-click when using the wireless mouse function.

[Freeze] button
Images are paused or unpaused each time the button is pressed.

[Num] button
This is used when entering and changing passwords.

[Menu] button
Displays and closes the configuration menu.

[Help] button
Each time this button is pressed, it displays and hides the online help menu that can assist you if you have a problem.

[Volume] buttons
Adjusts the sound volume.

[Color Mode] button
Changes the colour mode. When you press the button, the colour modes change in the following order.

Photo or Sports → Presentation → Theatre
Blackboard ← sRGB ← Game
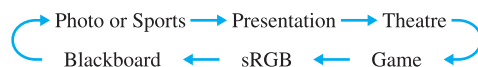
[Resize] button
When Component videog, Composite videog or S-Videog signals are being projected, the Aspect ratio changes each time this button is pressed.

Figure 1-6. Remote Control

1.3 Specifications

Projection System			RGB Liquid Crystal Shutter Projection
Projection Method			Front/Rear/Ceiling Mount
Specifications of main parts	LCD	Size	0.5 inches with MLA
		Driving Method	Poly-silicon TFT Active Matrix
		Pixel Number	480000 dots (800 x 600) x 3
		Native Resolution	SVGA
		Aspect Ratio	4 : 3
		Pixel Arrangement	Stripe
	Projection lens	Type	Manual focus
		F-number	1.4
		Focal Length	16.6 mm
		Zoom Ratio	1.0 to 1.35
		Offset	9.6 : 1
	Lamp	Type	135 W UHE
		Life	2000 h (High Brightness) 3000 h (Low Brightness)
	Optical System		Dichroic Mirror Separation & Prism combine Method
Screen Size (Projected Distance)			30 to 300 inch (1.19 to 12.12 m) (Zoom: Tele) 30 to 300 inch (0.87 to 8.97 m) (Zoom: Wide)
Brightness	High Brightness		1600 ANSI lumens (Color Mode: Game, Zoom: Wide)
	Low Brightness		1400 ANSI lumens Color Mode: Game, Zoom: Wide)
Contrast			500 : 1 Color Mode: Game, High Brightness)
Brightness Uniformity			85 % (Typ.)
Color Reproduction			Full-Color (16.77 million colors)
Sound Output			1W Monaural
Color Mode	PC		Photo, Presentation, Theatre, Game, sRGB, Black Board
	Video		Sports, Presentation, Theatre, Game, sRGB, Black Board
Effective Scanning Frequency Range (Analog)	Pixel Clock		13.5 MHz to 162 MHz
	Horizontal		15 MHz to 92 KHz
	Vertical		50 MHz to 85 Hz
Adjustment Function	Projector/Remote Control		Keystone/Brightness/Contrast/Tint/Saturation/Sound/ Input signal etc.
	Tilt Angle		0 to 10degrees
	Keystone Correction	PC	Vertical: -30 to +30 degrees
		Component Video	Vertical: -20 to +20 degrees Assuming the aspect ratio is 16 : 9.
Other Functions			Freeze, E-Zoom, A/V Mute, Pointer, User's Logo, Resize, Auto detection of RGB/YCbCr, Operation Lock, Password Protected (Security function), Direct ON

Analog RGB I/O	Display Performance	Native	800 x 600 dots
	Input Signal	Signal Type	Separate signal
		Video Signal	Analog (0.7 V p-p, 75 Ω/ Mac 0.714 Vp-p, 75 Ω)
		Sync. Signal	Separate (positive & negative, bi-polarity 2-5 Vpp) Composite (positive & negative, bi-polarity 2-5 Vpp) Sync-on-green (negative, 0.3 Vpp)
		Audio Signal	500 mVrms/47 KΩ
	Input Terminal	Video	Mini D-sub 15 pin x 1 (Blue)
		Audio	RCA x 2 (Whie/Red)
	Output Signal	Signal Type	Not analog-RGB standard level
	Video Output Terminal		Mini D-sub 15 pin x 1 (Black)
Video I/O	Display Performance		NTSC: 550 lines, PAL: 550 lines Depending on observation of the multi-burst pattern)
	Input Signal	Video Standard	NTSC/NTSC4.43/PAL/M-PAL/N-PAL/PAL60/SECAM
		Video Signal	Composite Video (1.0 Vpp/Sync.negative 75 Ω) S-Video (Luminous 0.714 Vpp, Chrominous 0.286 Vpp, 75 Ω) Component Video (Analog Y level 0.7 V 75 Ω/CrCb level ± 0.35 V 75 Ω/Sync., negative 0.3 V or 3-state ± 0.3 V on Y) Video-RGB (0.7 Vp-p, 75 Ω/Mac 0.714 Vpp, 75 Ω)
		Audio Signal	500 mVrms/47 KΩ
	Input Terminal	Video	Composite Video: RCA (Yellow) x 1
			S-Video: Mini DIN
			Component Video: Mini D-sub 15 pin (Blue) (in common with Analog RGB connector)
			Video-RGB: Mini D-sub 15 pin (Blue) (in common with Analog RGB connector)
		Audio	RCA x 2 (Whie/Red)
Control I/O	USB I/O	I/O Terminal	USB connector series B x 1 (for control of the mouse and keyboard)
Operating Temperature			5 °C to 35 °C [41 °F to 95 °F]
Cool-down period			A few seconds (Instant-Off)
Start-up period			About 5 seconds
Power Supply Voltage			100-240 VAC ± 10%, 50/60 Hz
Power Consumption	Lamp ON		195 W
	Stand-by		4.0 W
Dimension	Exclude Projection lens & Feet		246 (D) x 327 (W) x 86 (H) mm
	Maximum Dimension		246 (D) x 327 (W) x 98 (H) mm
Weight			Approximately 5.6 lb/2.5 Kg
Fan Noise	High Brightness		36 dB
	Low Brightness		28 dB
Accessories	Power Cable		1.8 m
	Computer Cable		1.8 m, Mini D-sub 15 pin - Mini D-sub 15 pin
	Remote Control		attached
	Battery		AAA battery x 2
	Audio Adaptor		3.5 mm stereo mini-plug (male)- 2 RCA (female) 15 cm
	Password Protect sticker		attached
	Soft Carrying Case		attached (new type)
Options			Lamp, Air filter, Soft carrying case (for a computer), Screen, Image Presentation Camera, Ceiling mount kit

1.4 Interface Specifications
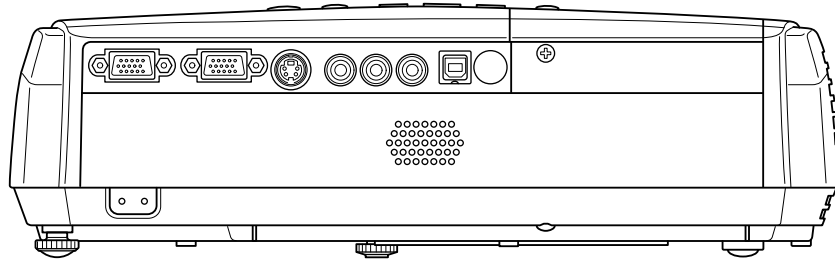
Figure 1-7.

1.4.1 Computer Port

□ Mini D-sub, 15 pin (input)

CN101
7513S-15G2-08
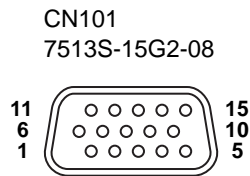
Pin No.	Signal Name	Pin No.	Signal Name
1	R	9	(No pin)
2	G	10	GND
3	B	11	GND
4	GND	12	SDA
5	GND	13	H Sync
6	GND	14	V Sync
7	GND	15	SCL
8	GND		

□ Mini D-sub, 15 pin (output)

CN102
7513S-15G2-08

Pin No.	Signal Name	Pin No.	Signal Name
1	OUT A	9	T.P
2	OUT B	10	GND
3	OUT C	11	T.P
4	T.P	12	T.P
5	GND	13	H Sync
6	GND	14	V Sync
7	GND	15	T.P
8	GND		

1.4.2 USB Interface

☐ USB-Type B

CN1600
UBB-4R-D14C
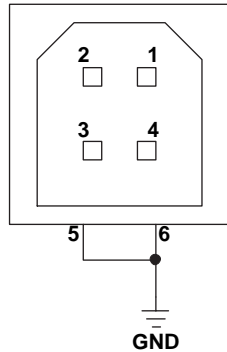
Pin No.	Signal Name
1	VBUS
2	D-
3	D+
4	GND
5	GND
6	GND

1.4.3 S-Video Interface

☐ Mini DIN4 pin

CN100
TCS7708-012021
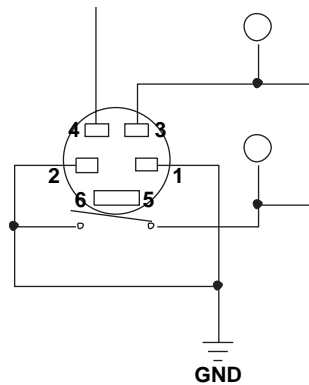
Pin No.	Signal Name
1	GND
2	GND
3	Y signal input
4	C signal input
5	DET
6	GND

1.4.4 Audio Input Interface/CVBS Input Interface

☐ Stereo mini pin jack

J100
YKC21-4098N
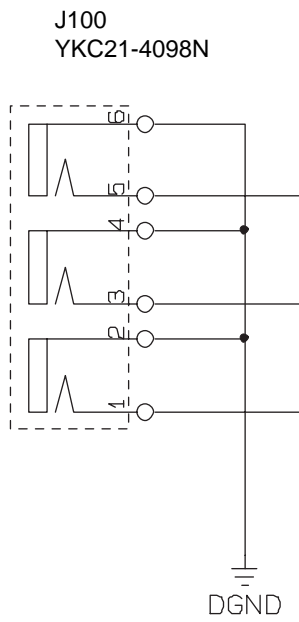
Pin No.	Signal Name
1	CVBS
2	GND
3	L
4	GND
5	R
6	GND

1.5 External Views
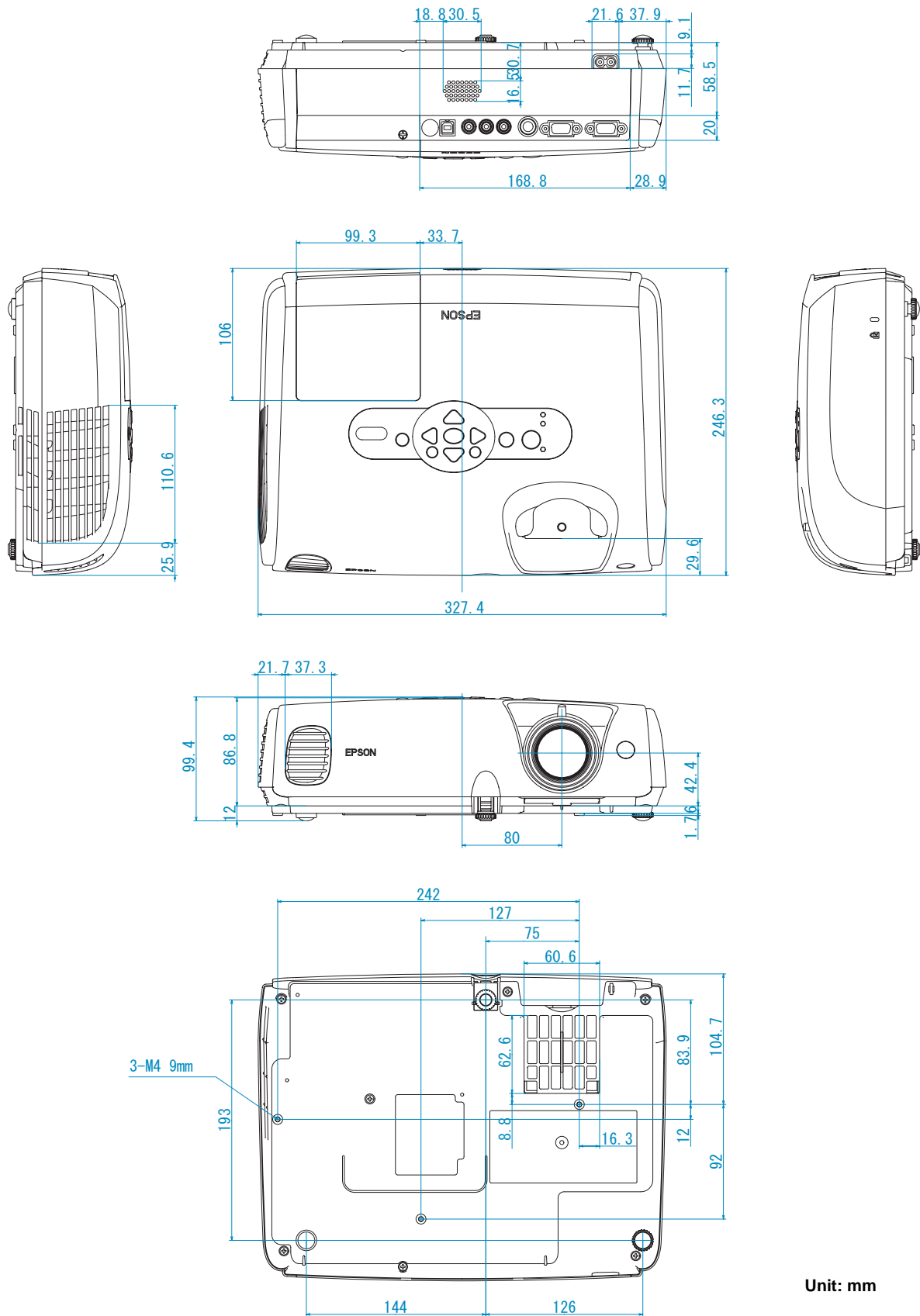
Unit: mm

Figure 1-8. External Dimensions
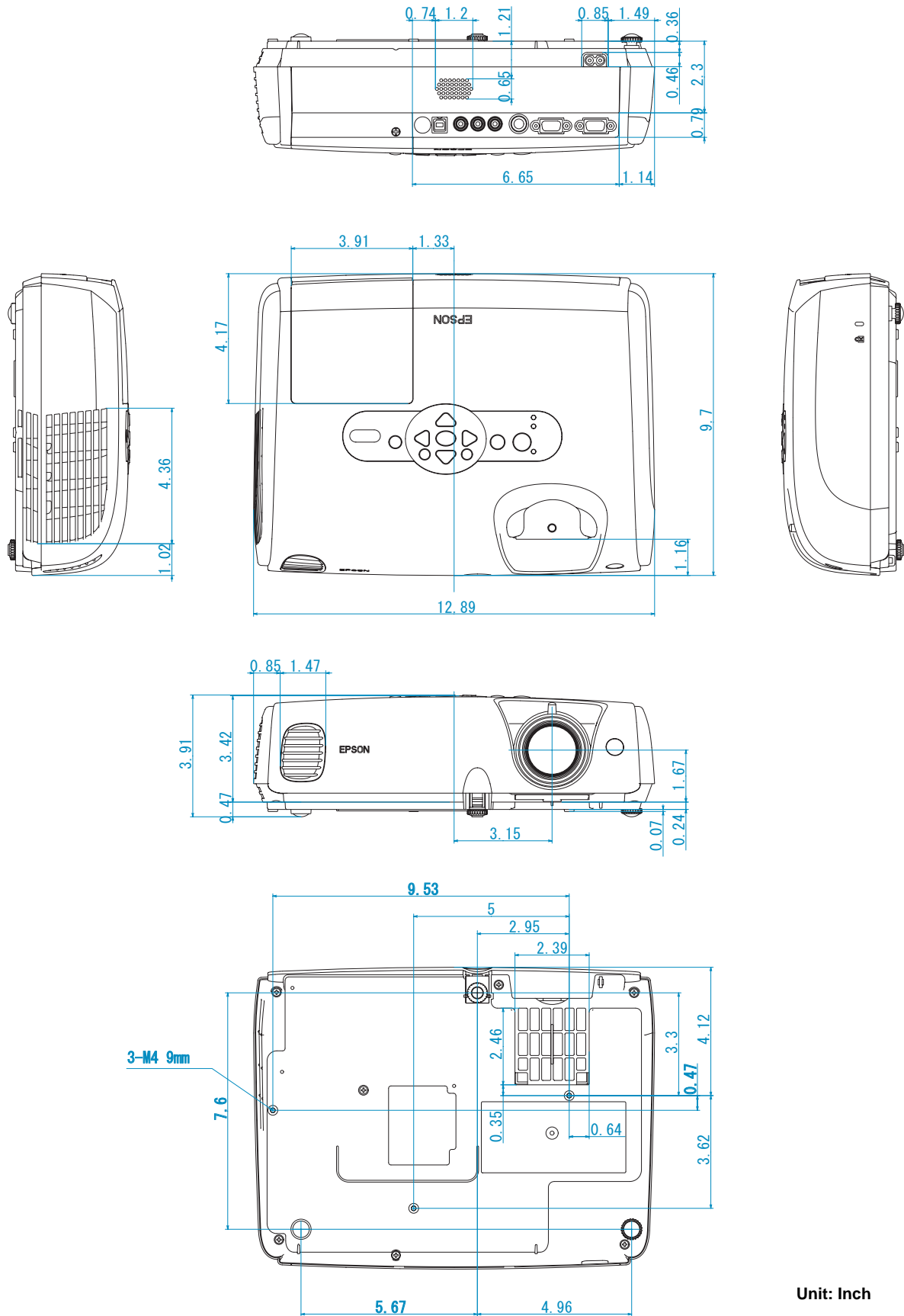
Figure 1-9. External Dimensions

Unit: Inch

Chapter 2   Theory of Operation

2.1 Hardware Overview

The hardware for the EMP-S3 can basically be divided into two sections: the optical engine and the circuit system. This section of the manual describes functions of the major hardware components.

The components and unit in the dotted frame shown in the diagram below make up an optical engine and MA Board Kit, which is provided as one part.
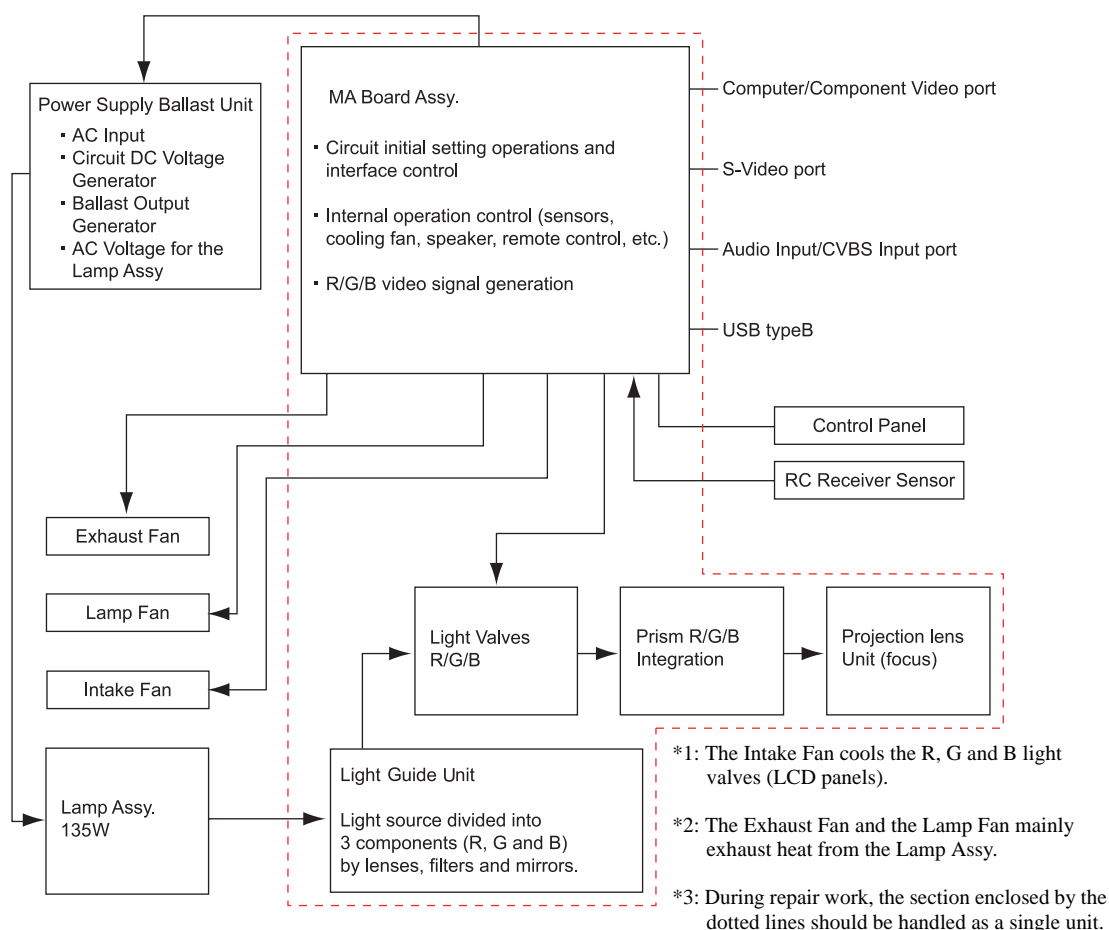
Figure 2-1.

Overview of Display Operation

1. The MA Board receives RGB/Component signals from the Computer port. Video signals or S-Video signals are provided to the MA Board from the CVBS input or S-Video port. Analog signals are converted to digital signals at the MA board.

2. The digital display signals are temporarily stored in video memory on the MA board.

3. The R, G and B light valves control the amount of light that passes through the valves.

4. The light that passes through the light valves is combined by the prism and projected as an image through the projection lens unit.

2.1.1 Component Connection Diagram

The connectors for the components and Main (MA) board are shown in the following diagram.
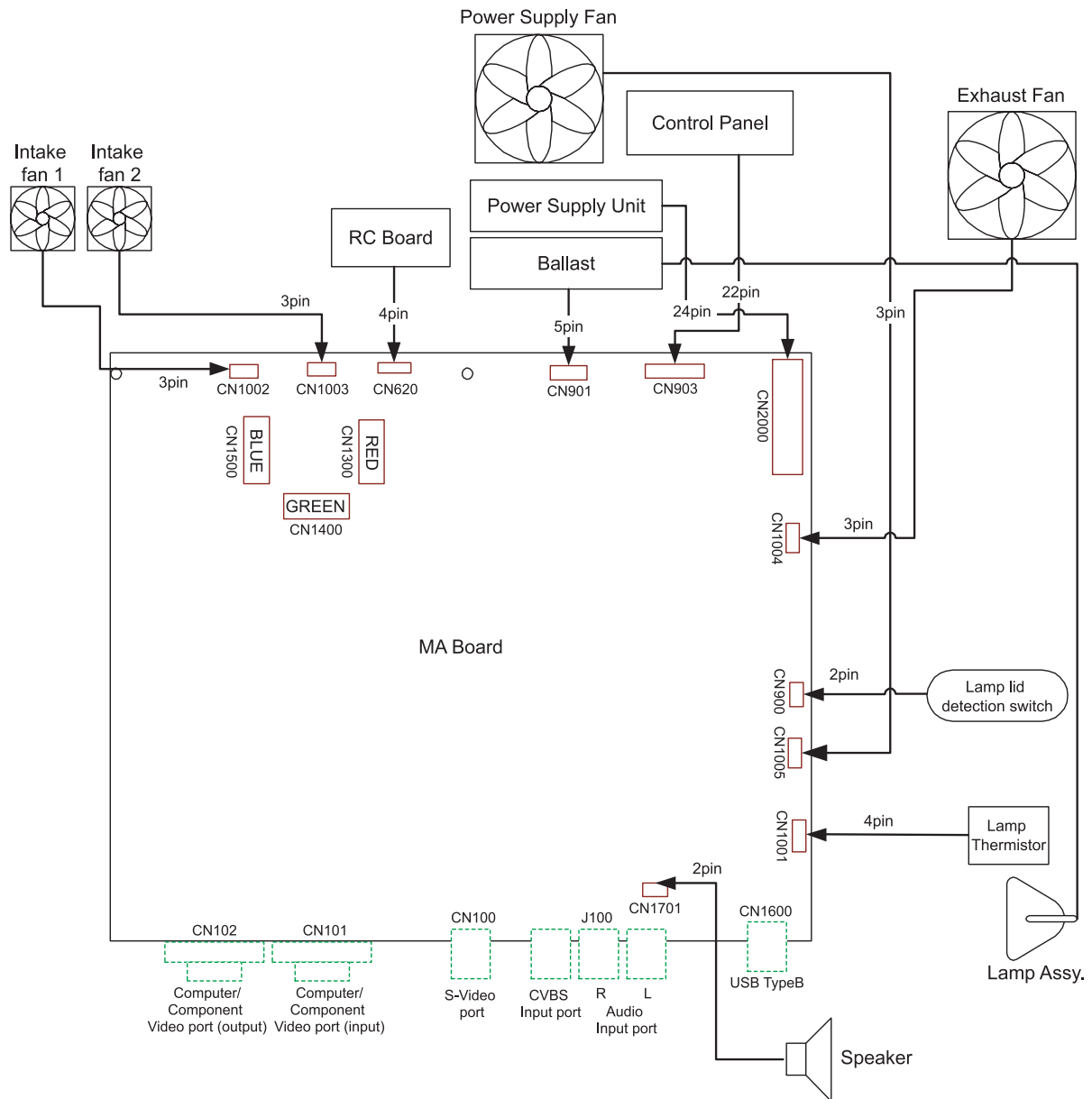
Figure 2-2. MA Board Connectors

2.1.2 Control Circuitry

The control circuits are illustrated in the following block diagram.
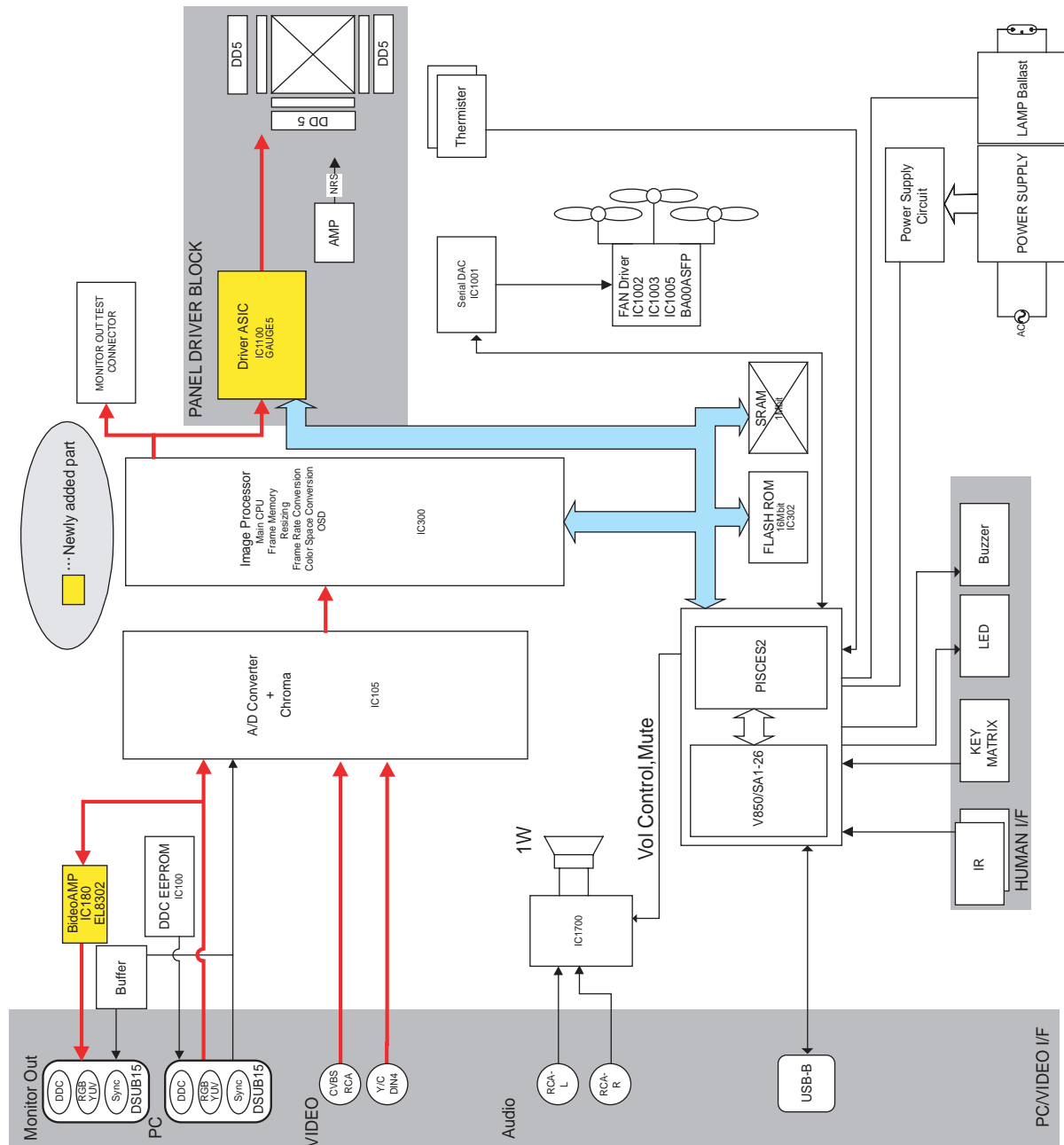
Figure 2-3. Control Circuit Block Diagram

2.2 Optical Engine

The optical system consists of four components: the Lamp Assys., the Light Guide Unit, the Panel-on-Prism (POP) Unit, and the projection lens. These four components together are called the Optical Engine.
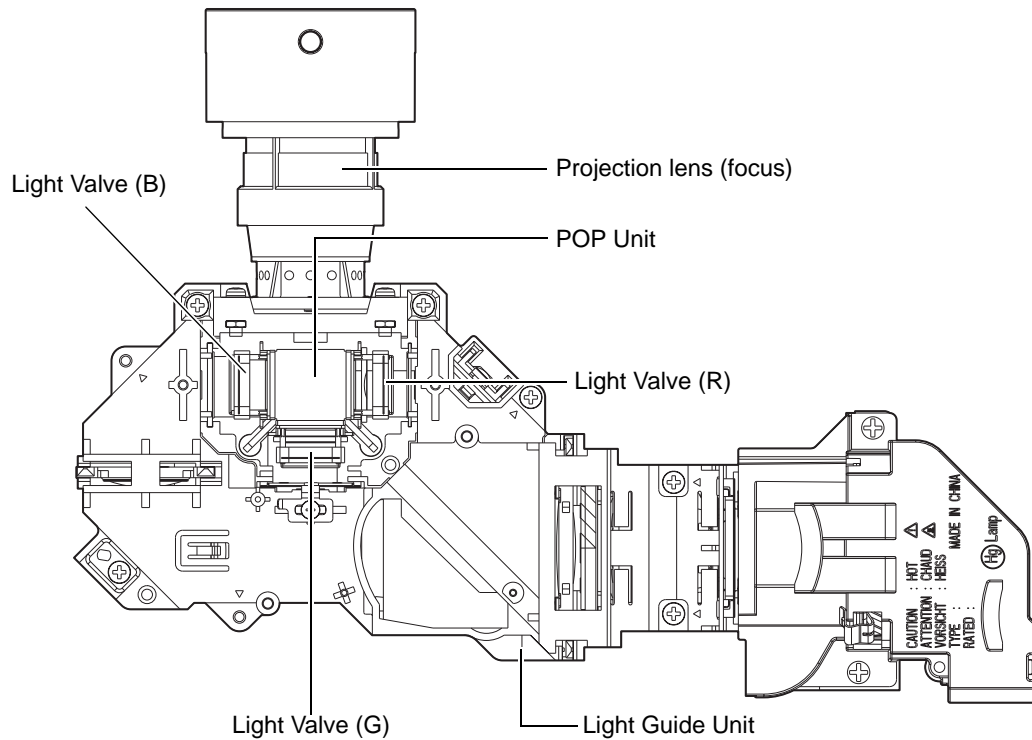
Figure 2-4. Optical Engine

Optical Engine
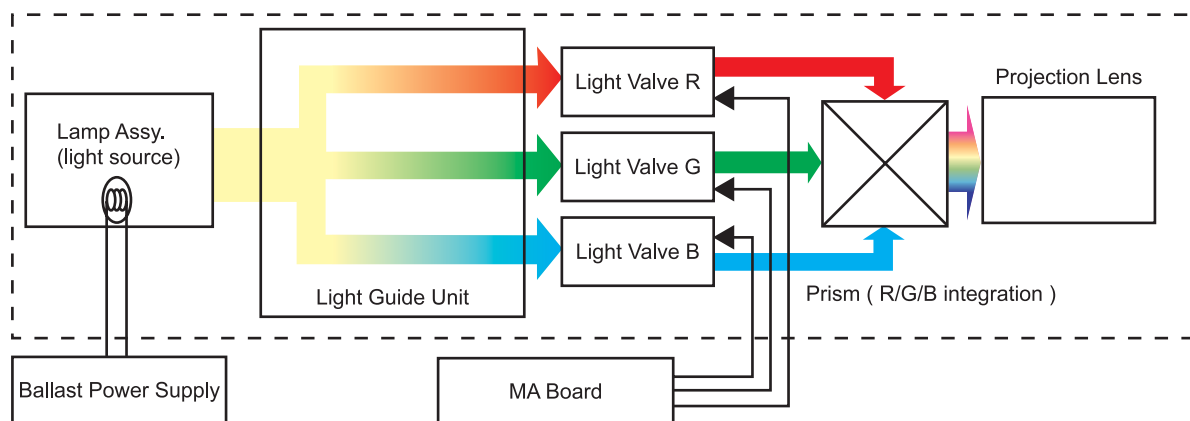
Figure 2-5. Optical Engine Functional Diagram

CHECK POINT ✓ The Lamp Assy., Light Guide Unit, POP Unit, and Projection Lens together make up the Optical Engine. These components are assembled and adjusted together at the factory, and are not available as separate service parts.

CAUTION !
- Do not subject the optical system components to physical shocks or strong vibration.
- Do not disassemble the Light Guide Unit. Disassembly will cause color distortion, even if reassembled very carefully.
- The Optical Engine and MA Board are figured and adjusted together at the factory. They are only available as a matched pair, and *must always be replaced together* when either the Optical Engine or MA Board has a failure.

Table 2-1.

Component Name	Function/Other
Lamp Assy.	An UHE-135W discharge lamp is the light source.
Light Guide Unit	The Light Guide Unit disperses the light from the light source via lens arrays A and B in order to provide uniform illumination. In addition, a UV filter protects the LCDs from harmful ultraviolet light. After this light is polarized, it is then split into 3 spectrums (R, G and B).
POP Unit and Projection lens	The Panel-on-Prism (POP) Unit, which incorporates the Light Valves, controls the intensity of the distributed components of the RGB light. The prism unit then integrates the RGB light and sends it through the projection lens.

2.2.1 Lamp Assy.

The Lamp Assy. is comprised of the Lamp (UHE-135W) and Ballast Power Supply Connector. The Ballast Power Supply Connector is used to supply the AC voltage from the ballast unit for driving the lamp. The lead wires are connected to the lamp.

The lamp is fastened to the bottom of the projector body with 2 screws. The lamp is a consumable part, and is to be replaced as the luminance of the Lamp Assy. declines over time as the lamp is used. Maximum luminance is obtained when a new lamp is first installed. After approximately 1,900 hours at high brightness or 2,900 hours at low brightness, the luminance will drop by approximately 50%.

Ballast Power Supply Connector
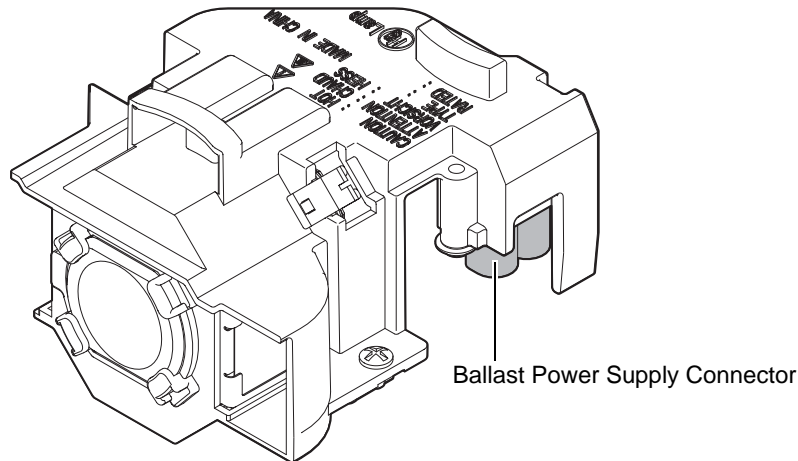
Figure 2-6.

The Lamp may be replaced at any time. Replace the Lamp Assy. before the full 1900-hour period (at high brightness) or 2900-hour period (at low brightness) has been reached if it seems that the luminance of the lamp is unacceptable during actual use.

The cumulative operating time for the Lamp Assy. is stored in IC300 (I/F Controller) on the MA board. When the lamp is replaced, the lamp timer should be reset using the Reset Lamp Timer function in the Reset menu. Check the Lamp Time in the About menu to confirm that the timer has been correctly reset.
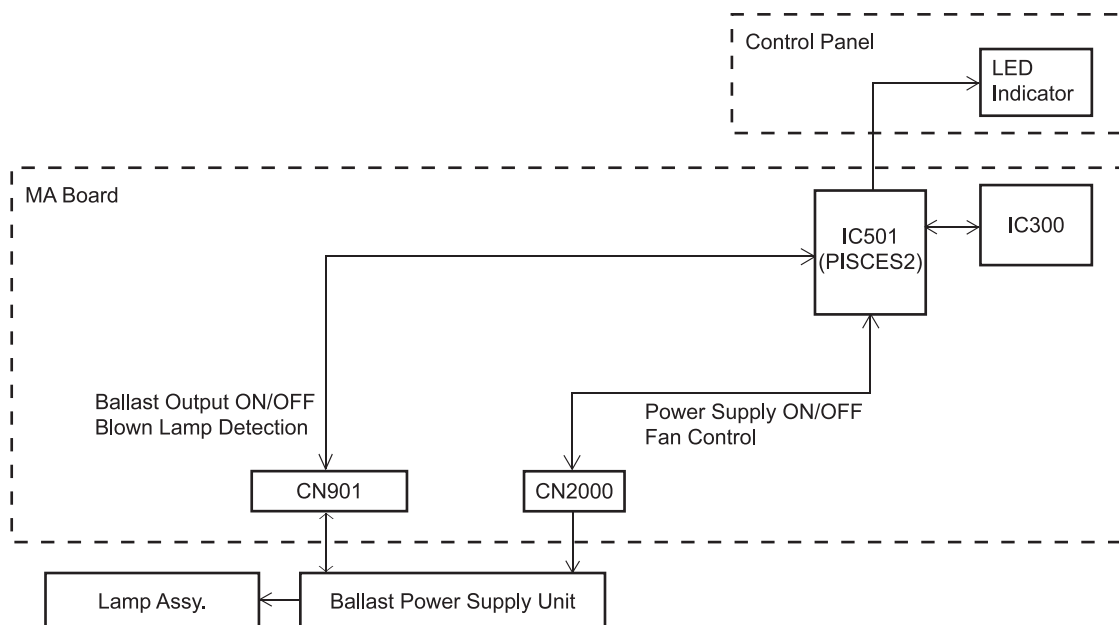
Figure 2-7. Lamp Assy. Control Circuit

2.3 MA Board

The MA board processes the core circuit controls for the projector, including interface control, operation panel control, temperature sensor circuit and fan control, ballast power supply control and the Infrared RC board interface.
The MA board also contains an imaging processor (PW465), EEPROM, digitizers (ADC and video decoder), and SRAM memory.

2.3.1 External View of MA Board

Figure 2-8. MA Board Top

Figure 2-9. MA Board Bottom

* The MA Board and the Optical Engine must always be replaced together.

2.3.2 Overview of Operation

Digitalization control of the picture signal

Converts the analog RGB image signals input from Computer/Component Video port from analog to digital form.

Frequency transformation control

Transforms the picture signal into the appropriate signals to drive the R, G and B LCD panels.

On screen display

Displays the menu and other information overlaid onto the input picture signal.

Remote control

Receives and decodes IR signals from the remote control and supplies control signals to various MA board circuits.

Mouse control

Converts pointer information contained within the remote control signals into mouse signals in PS/2 and USB serial format to send them to the computer.

Lamp control

Controls the ballast and lamp illumination.

LED control

Controls the display characteristics of the LEDs that indicate the power, temperature and operational status of the projector.

Cooling control

Measures temperature and controls the speed of the fan.

Power supply control

Controls low-power consumption, sleep and stand-by modes.

2.4 Interface Connectors

The MA board includes interface connectors for external devices such as video equipment. The MA board is equipped with the following connectors.
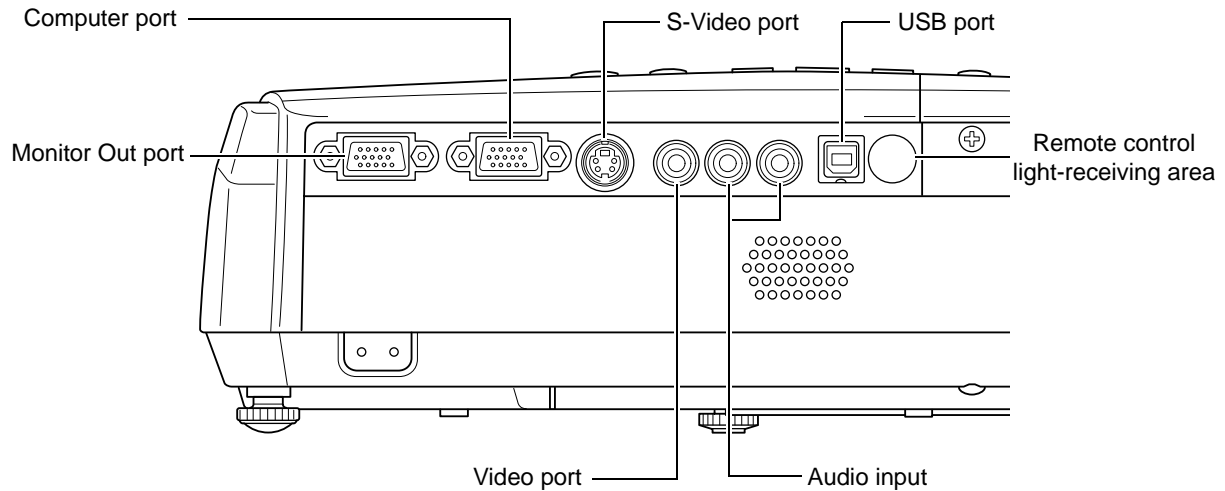
Figure 2-10. IF Board External Connectors
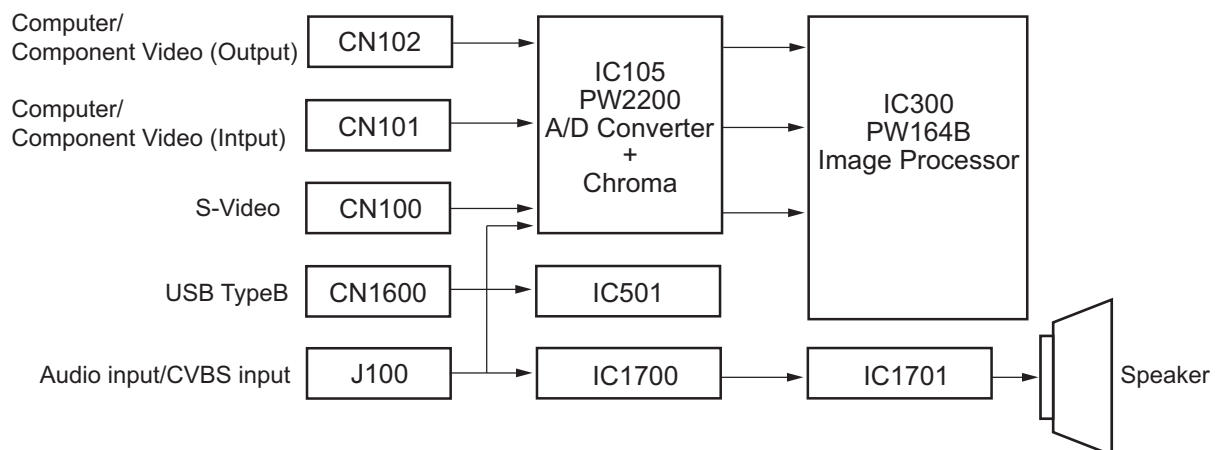
Figure 2-11. MA Board Block Diagram

2.5 Power Supply Ballast Unit

The Power Supply Ballast Unit contains the power supply/ballast section, power supply filter and the AC cord socket. The power supply/ballast section re-regulates the DC power supply that comes from the AC inlet and power supply filter in order to generate the AC power supply 135W for the UHE lamps.

AC Inlet
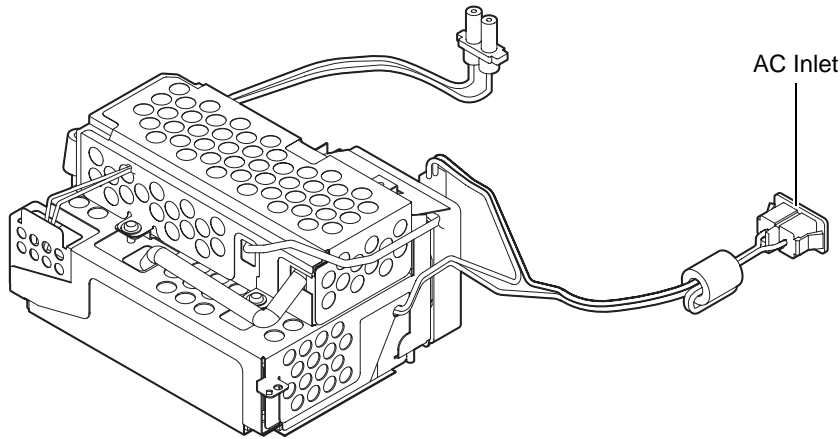
Figure 2-12. Power Supply Ballast Unit

2.5.1 Power Supply Circuit Block Diagram

AC Input
AC100-240V

EMI Filter

EMI Filter

Ballast output
195W

The First Power Supply
Smoothing/Control circuits

DC output
to CN2000
on MA board

Secondary Power Supply
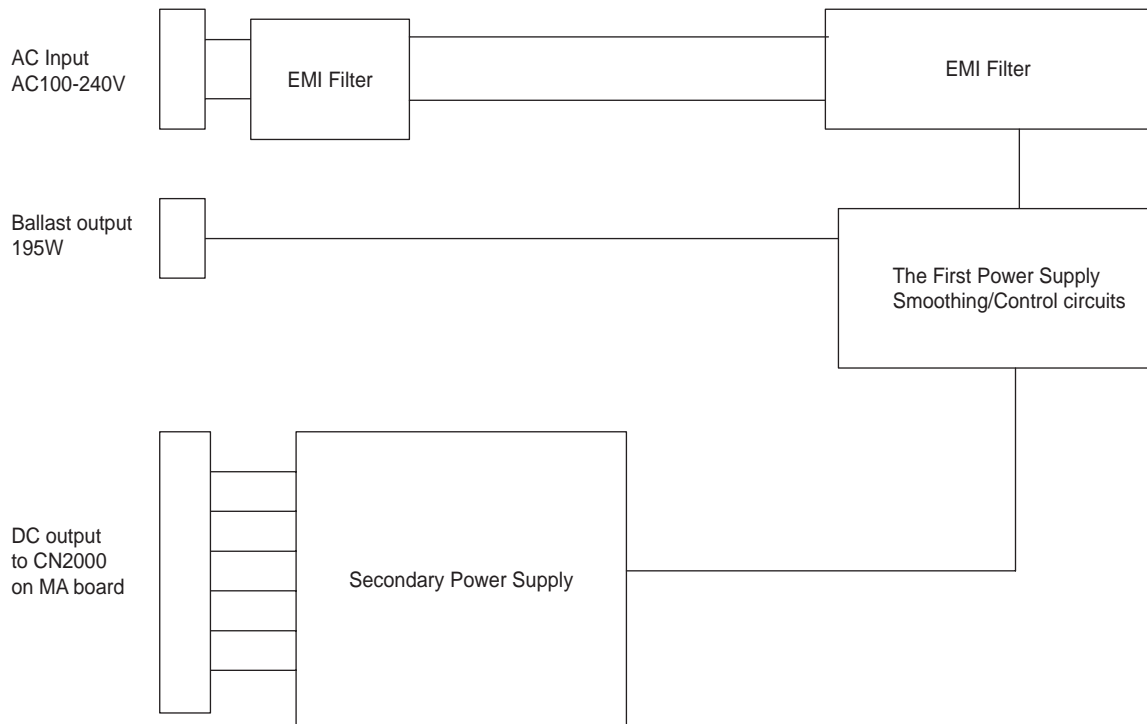
Figure 2-13. Power Supply Circuit Block Diagram

Fuse: Protects the power supply and internal circuitry from overcurrent on the AC supply line.

EMI filter circuit: Eliminates interference from the AC power supply input.

2.5.2 Overview of Operation

The output cable of the power supply unit is connected to CN2000 on the MA board. It allows the following voltages and signals to be transmitted.
- DC output
- The power supply On/Off signal (PWON)

> **CAUTION**
>
> ■ Background power is still supplied to the MA board through CN2000 connector as long as the power cord is connected to the projector, even if the **[Power]** switch is turned off.
>
> ■ The EMI filter/regulator circuit eliminates interference (noise) from the AC line and generates the DC voltage for the regulators.
>
> ■ The DC voltages shown in the tables below are generated by a Switching Regulator. No fluctuations in output potential occur as a result of load fluctuations, and the individual output voltages cannot be adjusted.

Table 2-2.

Output voltage		Output voltage accuracy	Ripple (mVpp)	Ripple/ Spike (mVpp)	Output current			Protection circuit		Load capacity (Reference) (ÉpF)
Signal name	Voltage				Standby mode	Min	Typ	Over-voltage	Over-current	
+5	+5 V	±5 %	100	200	20 mA to 220 mA	20 mA	3.5 A	-	Shutoff	100
+7	+7.2 V	+0.8 V/- -0.4 V	100	200	0 A	0 A	0.5 A	-	Shutoff	200
+13	+13.8	+15 V ~ +13.5 V	200	300	0 A	0.2 A	1.5 A	-	Shutoff	100+470
+18	+1.8	+16 V ~ +23 V	400	400	0 A	0.2 A	0.45 A	-	Shutoff	47
Ballast Output	380 VDC	360-400 VDC	25 Vpp	25 Vpp	(0.1)	(0.1)	195 W	410 V	Shutoff	

The power supply fan reduces the internal heat in the power supply unit. The heated air discharged from the power supply unit is then exhausted with the exhaust fan connected to CN1004 on the MA board.

2.5.3 Connector CN2000 Pin Layout
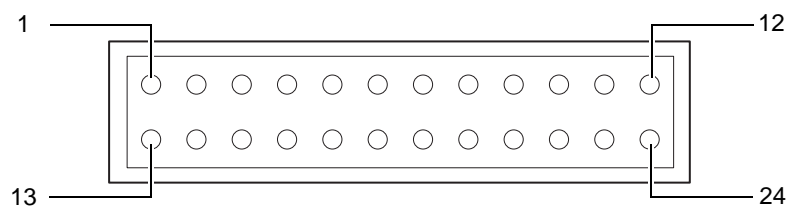
Figure 2-14.

Power Supply Connector (connected to CN2000 on the MA board) Pinout Definition

Pin No.	Signal name	Pin No.	Signal name
1	PFCON	13	GND
2	+5 V_T	14	+5 V_T
3	GND	15	GND
4	+5 V_T	16	+5 V_T
5	+5 V_T	17	+5 V_T
6	+7 V	18	+7 V
7	GND	19	GND
8	+12 V	20	+12 V
9	GND	21	GND
10	+18 V	22	+18 V
11	GND	23	FANCON1 (reserved)
12	NC	24	FANCON2 (reserved)

2.6 RC Board Assembly

The Remote Control (RC) board is equipped with sensors that detect (receive) infrared signals transmitted from the remote control. The two RC IR sensors are mounted on the front and rear of the projector.
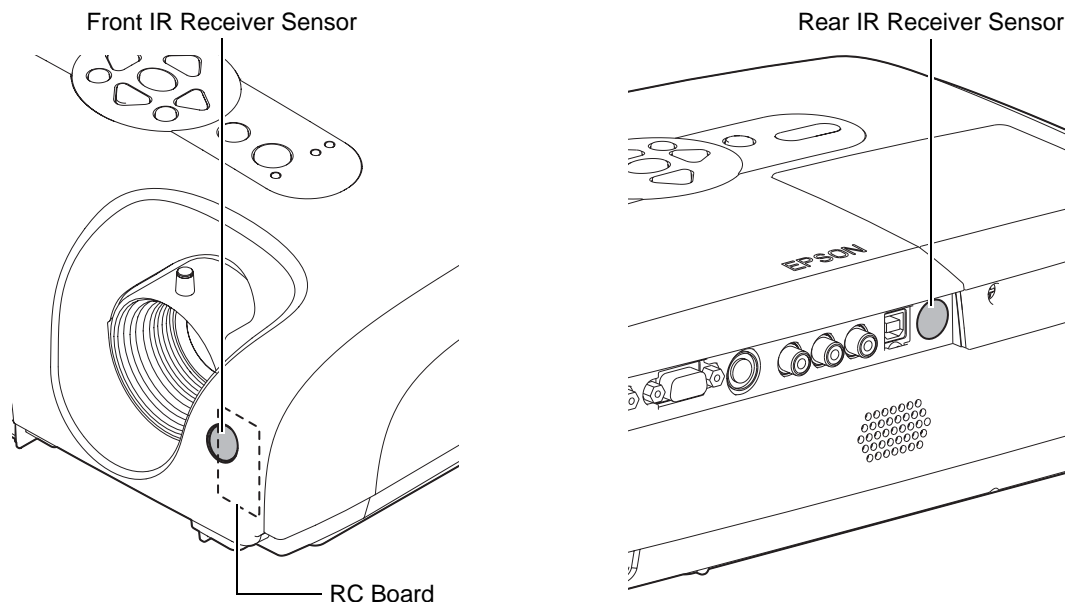
Figure 2-15. RC Receiver Sensor

The output signals (serial data) received by the sensors are sent to IC501 (PISCES2) on the MA board. The MA board uses the serial data received from the remote control button switches to control the power ON/OFF status, menu start, and control the display (temporary stop, blank, etc.).

The remote control function is illustrated in Figure 2-16.
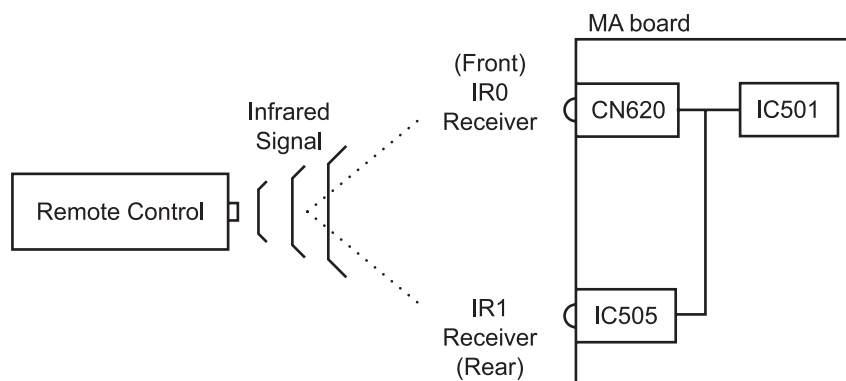
Figure 2-16. Remote Control Circuit Block Diagram

2.7 Speaker

The projector has a single 1 W built-in speaker that is at the rear of the projector.
It can be used for monaural output of the sound that is input to the projector from a host computer or video source.

The signal from the computer or video source is amplified by the audio control circuits on the AV board and then output to the built-in speaker through connector CN1701.
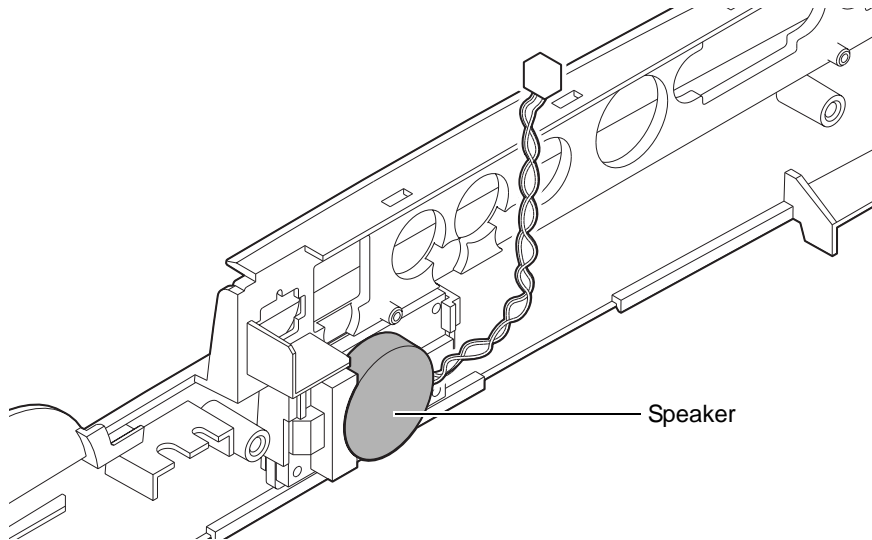
Figure 2-17. Speaker

The following diagram illustrates the circuits that control the speaker.
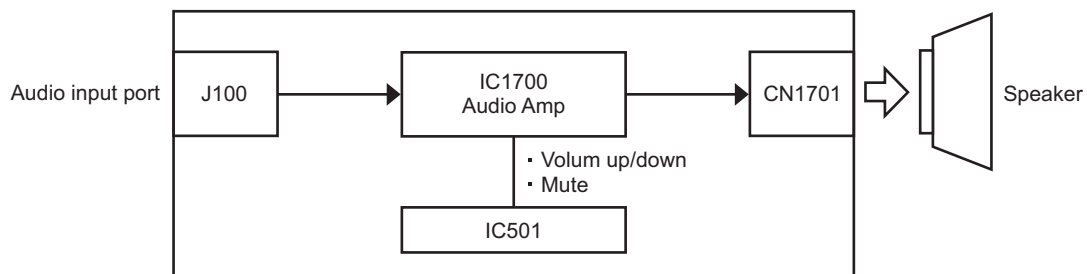
Figure 2-18. Speaker Control Circuit Block Diagram

2.8 Temperature Control

2.8.1 Sensors and Switches

This projector is equipped with the devices shown in the table below in order to protect the safety of the operator and maintain general safety with regard to the projector itself by preventing abnormalities in operation.

Table 2-3.

Sensor/Switch	Location	Function
Lamp lid detection switch	On the Exhaust Duct Inner	Interrupts AC power when the lamp lid is opened. Power cannot be turned on until the lid is closed.
TH board	On the Exhaust Duct Inner	Prevents overheating around the Lamp Assy. Turns the lamp off when a temperature rises above a certain level.
Safety Switch	On the side of the Exhaust Duct Inner	Prevents overheating around the Lamp Assy. Interrupts the AC power when a temperature rises above a certain level.

Lamp Lid Detection Switch

This switch is located on the Inner Exhaust Duct and connected to the lamp lid latch on the inside base of the projector, and prevents current from going to the lamp if the lamp lid is open. This lid is opened only when the operator is replacing the Lamp Assy. The switch is provided in order to prevent the danger of burns that could occur if the lamp turned on accidentally. The lamp lid detection switch is connected to CN900 on the MA board. When the lamp lid opens, IC501 (IFCPU) detects the lamp lid open signal and sends the Lamp OFF signal to turn off the lamp.

Lamp Lid Detection Switch
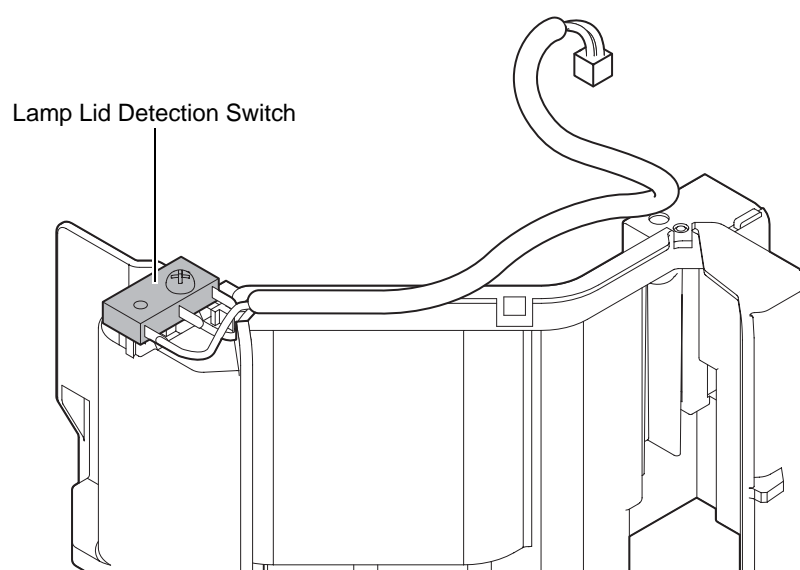
Figure 2-19. Lamp Lid Detection Switch

TH Board

The TH Board is attached to the Inner Exhaust Duct to detect the temperature of the lamp section. To prevent damage to the surrounding components from overheating, the power save controller on the MA board first provides a warning indication through the temperature indicator LED, and stops the output of the ballast when the temperature rises above a given level.
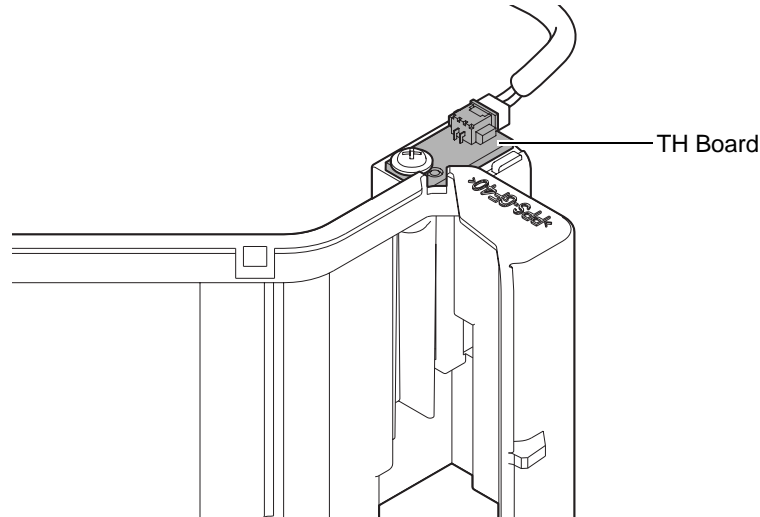
Figure 2-20. TH Board

Safety Switch

This is a backup overheating prevention switch mounted on the side of the Inner Exhaust Duct. If overheating occurs around the Lamp Assy. due to problems with the exhaust fan, the lamp is normally turned off by the TH Board to prevent overheating. The Safety Switch is provided as a backup in case the TH Board and temperature detection circuit fail simultaneously. When the temperature rises above a given level, the safety switch interrupts AC power to stop all regular operations. Once the safety switch is activated, power cannot be switched on again until the temperature falls below the given level.
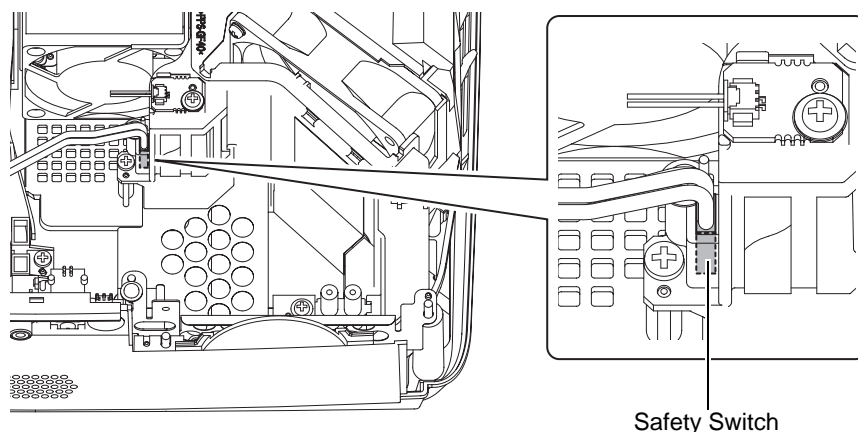
Figure 2-21. Safety Switch

Thermistor and Temperature Sensor Operation

Analog/Digital converters in IC702 and IC703 (V850) on the MA board detect the temperatures of the Optical Engine and Power Supply sections by means of the two Lamp Thermistors at intervals of 1 second. Based on the measurement results, the CPU controls fan operations and power supply shutdown operations as necessary.

Table 2-4. Temperature Sensors

Condition	Warning Indicator	Meaning
Normal temperature	Off	Normal operation in progress
Warning temperature	Flashes orange	If temperature rises any higher, projection stops.
Abnormal temperature	Steady red	Overheating (no projection)
Internal error	Flashes red	Problem with fans, thermistors or temperature detection circuit

See Section 2.8.2 for more information on fan operation, and Section 2.9 for more information on the LED status indicators.

2.8.2 Fan Operation

There are four cooling fans inside the projector. These fans discharge heated air produced by the Lamp Assy., power supply unit, and ballast unit.
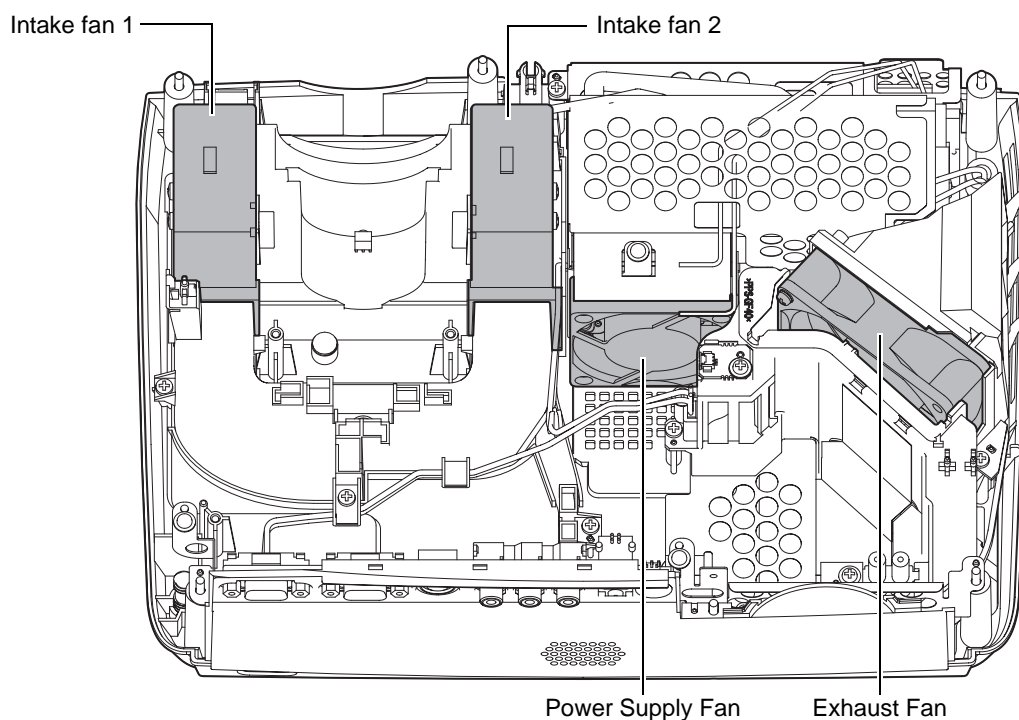
Figure 2-22. Fan Locations
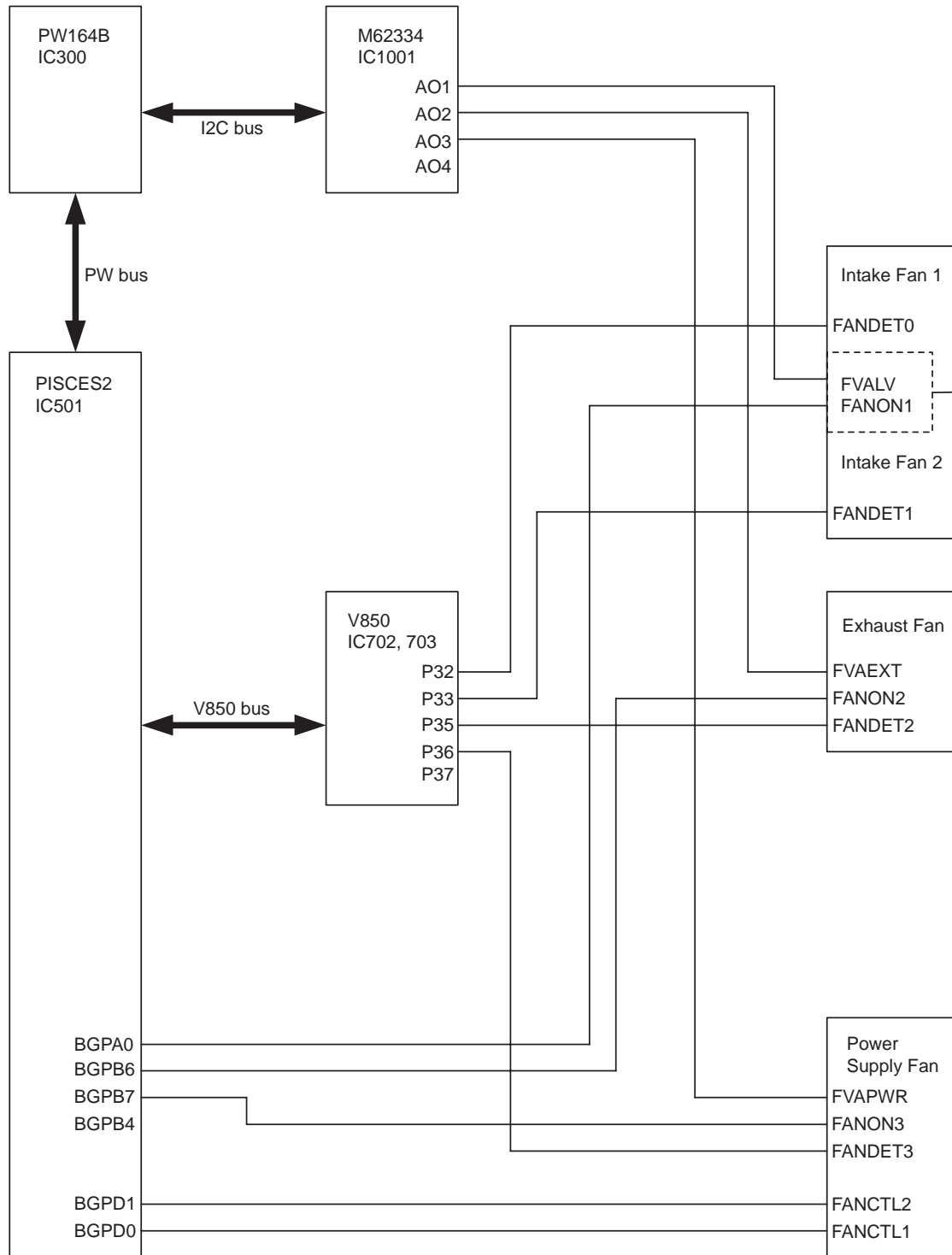
Figure 2-23. Fan Control Circuit Block

Operation Control

The MA board is connected to the Lamp Thermistor. The driver CPU controls the operation of the four fans, Intake fan 1, Intake fan 2, Exhaust fan and Power Supply fan, based on the temperatures detected by the thermistor.

The signals output by IC1100, the driver CPU on the MA board, are used to change the output from the fan drive regulator circuit on the MA board in order to control Intake and Exhaust fans. The feedback signals from the fans are used by the CPU to monitor the fan operation (stopped or running) for any abnormalities. If the feedback signal indicates a condition that the CPU does not expect, the CPU determines that there is an abnormality in the operation of the fan and immediately turns off the lamp and causes the warning indicator to light red.

Fan Operation

☐ Standby Mode

Intake Fan (LV/G FAN):	Operates at a constant speed from power-on.
Intake Fan (LV/R FAN):	The rotating speed is adjusted according to preset temperatures detected by the thermistor.
Exhaust Fan:	Turns on the power supply fan and starts to operate at low speed when the thermistor detects temperatures higher than a given level, and stops when the temperature becomes lower than the level.

☐ When the Lamp is ON

The intake and exhaust fans start to operate at low speed 0.5 seconds before turning the lamp on. After the lamp turns on, the fan operates at high speed or low speed based on the temperatures detected by the thermistor.

☐ During Cool-down

When the lamp is turned off, the fans operate for a few seconds to cool the projector.

2.9 LED Indicators

The MA board has three LEDs that indicate the operating status of the projector.
The status indicators are located on the upper case unit.
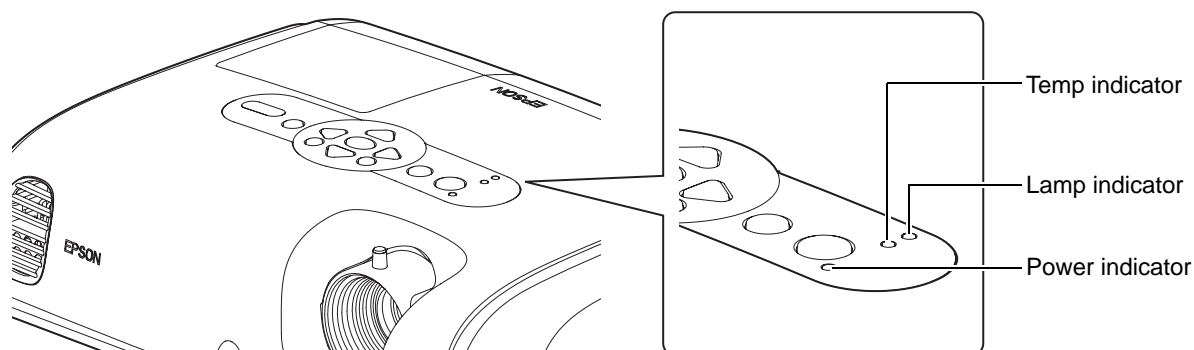
Figure 2-24. Status Indicator LEDs Location

The following tables show what the indicators mean and how to remedy any problem indicated.

□ Power indicator lights red: Abnormal

● On   -●-Blink   ○ Off

Indicator Status	Projector Status	Problem and Remedy
Power ● Red ☼ -●- Red 🌡 -●- Red	Internal error	Stop using the projector, disconnect the power cable from the electrical outlet, and contact your dealer or the nearest address provided in the "International Warranty Conditions" section of the Safety Instructions/ World-Wide Warranty Terms booklet.
Power ● Red ☼ ○ 🌡 -●- Red	Fan related error Sensor error	Stop using the projector, disconnect the power cable from the electrical outlet, and contact your dealer or the nearest address provided in the "International Warranty Conditions" section of the Safety Instructions/World-Wide Warranty Terms booklet.
Power ● Red ☼ ○ 🌡 ● Red	Internal temperature error (overheating)	The lamp will turn off automatically and projection will stop. Wait for about 5 minutes. After about 5 minutes the projector will switch to standby mode, so check the following two points. • Check that the air filter and air exhaust vent are clear, and that the projector is not positioned against a wall. • If the air filters are blocked, clean or replace them. If this does not solve the problem and the projector continues to overheat or the indicators continue to show a problem when the power is turned on, stop using the projector, disconnect the power cable from the wall outlet, and contact your dealer or the nearest address provided in the "International Warranty Conditions" section of the Safety Instructions/World-Wide Warranty Terms booklet. After checking, press the **[Power]** button to turn the power back on.

Indicator Status	Projector Status	Problem and Remedy
Power ● Red ☼ ⊙ Red (blink) 🌡 ○	Lamp timer failure Lamp out	Take out the lamp and check if it is broken. If the lamp is not broken, put it back in and then turn the power on. If the lamp still does not turn on, replace it with a new lamp. If this does not solve the problem, stop using the projector and disconnect the power cable from the electrical outlet. Then contact your dealer or the nearest address provided in the "International Warranty Conditions" section of the Safety Instructions/World-Wide Warranty Terms booklet If the lamp is broken replace it with a new lamp, or contact your local dealer for further advice to. If replacing the lamp yourself, be careful to avoid pieces of broken glass. (Projection cannot be carried out until the lamp is replaced.) Check that the lamp and the lamp cover are securely installed. If the lamp or lamp cover is not securely installed, the lamp will not switch on.

□ Lamp or Temp indicator flashes orange: Warning

● On   ⊙-Blink   ○ Off

Indicator Status	Projector Status	Problem and Remedy
Power ⊙ Red ☼ ○ 🌡 ⊙ Orange	High-speed cooling in progress	This is not an abnormality, but if the temperature rises too high again, projection will stop automatically. • Check that the air filters and air exhaust vent are clear and that they are not up against a surface such as a wall. • If the air filters are clogged, clean or replace them.
Power ● ☼ ⊙ Orange 🌡 ○	Lamp replacement notification	Replace the lamp with a new one. If you continue to use the lamp after it has passed the replacement period, the possibility that the lamp may break will increase. Replace the lamp with a new one as soon as possible. The Power indicator status will vary depending on the projector status at the time.

Chapter 3   Troubleshooting

3.1 Before Carrying Out Troubleshooting

- If repairs involving the replacement of parts or components have been carried out, always be sure to re-check whether the replacement parts themselves are operating correctly or not in order to determine whether the problem is the result of something such as a loose connector.
- All instructions and procedures listed in troubleshooting flowcharts should be carried out as given.
- Follow the procedures given in Chapter 4 Disassembly and Assembly when replacing any of the projector components.
- When checking the operation of the projector, always check that the connectors are connected securely before proceeding to other checks.
- In order to confirm proper operation, use AC power from a normal source and use the correct cable type.

3.1.1 Troubleshooting Tools and Equipment

The following tools and equipment will be required in order to carry out troubleshooting, and so you should check that they are on hand.

Table 3-1.

Name	Quantity	Application/Other
Projection screen	1	Projecting images
Tape measure (3 m)	1	Measuring projection distances
Host computer	1	Transmitting audio and image data
USB mouse	1	Checking the operation of the mouse
Video equipment	1	Transmitting audio and image data
Multi meter	1	Measuring resistance values and voltages (AC/DC)
Double-sided tape	Short length	Attaching parts
General tools	1 set	Tools and equipment listed in Section 4.1.2

3.1.2 Field Replacement Parts

Many of the components that comprise a service unit have each been adjusted in relation to each other. Therefore, when replacing parts during troubleshooting or repair, do not disassemble service units in order to harvest and use constituent components. This is especially critical for the components in the optical engine (Light Guide Unit, Prism Unit and Light Valves) and the MA Board.

Carry out the safety tests after parts replacement is completed.

3.2 Overview

Check the nature of the problem using the following flow diagram, and then proceed to the corresponding flow chart (on the following pages).

START	
Exterior Check	• Check for any external abnormalities, such as a damaged case.
Internal Cable Check	• Remove the Upper Case unit and check the cable connectors on the MA Board. Reconnect any loose cables as required.
Power Supply On/Off	• Connect the power cord and turn on the power. Check the initial operations until the **NO SIGNAL** message appears, and then check the power off operation. 1). After power is turned on, the Power indicator flashes green and projection starts. 2). After about 40 seconds, the operation indicator lights green, and projection starts at maximum brightness.
Image Display and Quality	• Carry out the following three steps. 1). Check and adjust the projector's Front Feet as appropriate for the projection position and distance. 2). Adjust the image using the Focus Ring. 3). Press the [Auto] button to optimize the display. • Display input/output and image quality. Use the **[Source]** and **[Enter]** buttons to change input. Check the quality of input and output signals from Computer/Component Video, S-Video and CVBS sources.
Audio Output	• Check that there are audio inputs from Computer/Component Video, S-Video and CVBS. Also check the operation of the **[AV Mute]** button.
Control Panel	• Test the operation of each button on the control panel.
Remote Control	• Test the operation of each button on the remote control.
USB Mouse	• USB mouse operations using USB interface.
Other	• Examine the unit for abnormal noise, image problems, unusual odors, and smoke.

3.2.1 Exterior Check

START

Upper Case Unit
- There should be no damage, deformation or cracking due to external force.
- The Lower Case should be installed correctly.
- The remote signal receiver should be clean and free from foreign materials.

Control Panel
- The Upper Case should be correctly installed.
- No buttons should be stuck down.

Projection Lens Unit
- The Focus Ring should turn smoothly.
- The Lens should be clean and free from damage.

Lower Case
- There should be no damage, deformation or cracking due to external forces.
- The vent hole should be clean and free from any foreign materials.

Air Filter
- The Air Filter should be installed correctly.
- Remove the Air Filter from the Lower Case to check that it is clean
- The Intake Fan inside the Air Filter frame should be clean and free from foreign materials.

Lamp Lid Unit
- The Lamp Lid should be securely attached to the Lower Case.
- The Lamp Lid Detection Switch latch should be free from damage.

Lamp Assy
- The plastic frame should be free from any deformation, damage or discoloration from heat. Remove the lamp inner unit to check.
- The power supply connector should be free from discoloration.
- The white glass surface of the lamp should be clean.

Adjustable Front Foot Unit
- Can the projection height be adjusted with the Foot Unit?

Interface Connectors
- The connectors and terminals should not be bent or discolored.
- The connectors and terminals should be free from foreign materials.

AC Inlet
- The AC connectors should not be discolored.
- The AC source socket should be free from damage.

Air Filter/Lamp Assy Installation

3.2.2 Internal Cable Check

Turn off the power and disconnect the power cable before you begin the following connector checks. See Figure 2-2 on page 2-3 for the location of the MA Board connectors.

```
          START
            │
            ▼
    ┌──────────────┐
    │ Upper Case Unit │
    │    Removal    │
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ Control Panel │         • MA Board CN903 (Lock-type connector)
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │  Exhaust Fan  │         • MA Board CN1004
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ LAMP Themistor │        • MA Board CN1001
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │   RC Board    │         • MA Board CN620
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ Intake Fan 1, 2 │       • MA Board CN1002, CN1003
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ Light Valve R/G/B │     • MA Board CN1300/CN1400/CN1500 (Lock-type connector)
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ L/V Thermistor │        • MA Board CN1000
    └──────────────┘
            │
            ▼
    ┌──────────────────────┐
    │ Power Supply Ballast Unit │ • MA Board CN2000, CN901
    └──────────────────────┘
            │
            ▼
    ┌──────────────┐
    │ Power Supply Fan │      • MA Board CN1005
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ Lamp Lid Detection │    • MA Board CN900
    │     Switch    │
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │   Lamp Fan    │         • MA Board CN1006
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ MA Board Removal │
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │    Speaker    │         • MA Board CN1701
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ MA Board Installation │
    └──────────────┘
            │
            ▼
    ┌──────────────┐
    │ Upper Case Unit │
    │  Installation │
    └──────────────┘
```

3.2.3 Power Supply On/Off

START

Power cord connection

Is the ⏻ indicator lit orange? — No → Replace the Power Supply Ballast Unit

Yes ↓

Press the **[Power]** button on the control panel. Does the ⏻ indicator flash green? — No → Press the **[Power]** button on the remote control.

↓

Does the ⏻ indicator flash green? — No → Replace tha Optical Engine and the MA Board.

Yes ↓

Reconnect or replace the control panel.

To START

To START

Yes ↓

Does the ⏻ indicator flash green? — No → Refer to "2.9 LED Indicators" on page 2-21.

Yes ↓

A

(To next page)

(Continued from previous page)

A

Is the lamp turned on?	No →	Replace the Optical Engine and MA Board.

Yes ↓

Press the **[Power]** button to turn the power off.

↓

Does the ⏻ indicator flash orange?	No →	Replace the Optical Engine and MA Board.

Yes ↓

Does the ⏻ indicator light orange after it flashes for approx. 2 seconds?	No →	Replace the Optical Engine and MA Board.

Yes ↓

Image Display and Quality

Remedy For Power Supply Problems

1. Determine whether the problem is being caused by components inside the power supply unit, or whether it is being caused by some external factor. To determine this, check factors such as output voltage, internal temperature, appearance of components, odors and smoke.

2. If the cause is judged to be an internal problem, replace the power supply unit. If the newly-replaced power supply unit also has a problem and the symptoms are the same as before, then the cause of the problem is probably some external factor. Eliminate the external factor that is causing the problem.

3. If the power supply unit is recoverable but is not working properly, for example if high temperatures are causing the thermostat to shut down the power supply, or if the overcurrent protection circuit has tripped, then there is no need to replace the power supply unit.

4. If the power supply unit is not recoverable and is not working properly, for example if an overcurrent has repeatedly blown the fuse, replace the power supply unit.

3.2.4 Image Display and Quality

> **CAUTION**
> **!**
>
> ■ The image quality can also be affected by condensation or by a dirty lens. If condensation forms, the problem will correct itself naturally if the projector is left to stand for a while.

START

Press the **[Power]** button to turn the power on.

Does an image appear on the screen? — Yes

No

Is the lamp turned on? — Yes

No

Replace the Lamp Assy.

Is the lamp turned on? — Yes

No

Replace the Optical Engine and MA Board

Does "**NO SIGNAL**" appear in the bottom-left of the screen? — Yes

No

Replace the Optical Engine and MA Board

1. Adjust the height using the front adjustable foot.
2. Press the ['△'] or [_△_] button to correct distortion.
3. Adjust the focus with the Focus Ring.

Does the image appear clearer? — Yes

No

Clean the Projection Lens.

Does the image appear clearer? — Yes

No

Clean the areas around the Light Valves.

Does the image appear clearer? — Yes

No

Replace the Optical Engine and MA Board

B

(To next page)

(Continued from previous page)

B

C

Connect the host computer to the Computer connectors and display an image.

Does an image appear on the screen? → Yes

No

Press the **[Source]** button to change the display to Computer.

Does an image appear on the screen? → Yes

No

Replace the computer cable.

Does an image appear on the screen? → Yes

No

Replace the Optical Engine and MA Board

Is the image quality good? → Yes

No

1. Press the **[Menu]** button.
2. Select the "Image" menu.
3. Adjust the brightness and contrast.

Is the image quality good? → Yes

No

Replace the Optical Engine and MA Board

Connect external devices to all the interfaces. → Yes

No

Connect a source to the interface to be checked.

C

Audio Output

3.2.5 Audio Output

```
                    ┌──────────┐
                    │  START   │
                    └────┬─────┘
                         │
                         ▼
┌─────────────────────────────────┐
│ Connect the audio input connector│
│ and host computer. Press the     │
│ [Source] button to select the    │
│ corresponding input source, and  │
│ output sound from the internal   │
│ speaker.                         │
└──────────────┬──────────────────┘
               │
               ▼
┌──────────────────────────┐  Yes
│ Is sound output from the  ├────►
│ built-in speaker?         │
└──────────────┬───────────┘
               │ No
               ▼
┌──────────────────────────┐
│ Reconnect CN1701 on the   │
│ MA board                  │
└──────────────┬───────────┘
               │
               ▼
┌──────────────────────────┐  Yes
│ Is sound output from the  ├────►
│ built-in speaker?         │
└──────────────┬───────────┘
               │ No
               ▼
┌──────────────────────────┐
│ Replace the audio cable.  │
└──────────────┬───────────┘
               │
               ▼
┌──────────────────────────┐  Yes
│ Is sound output from the  ├────►
│ built-in speaker?         │
└──────────────┬───────────┘
               │ No
               ▼
┌──────────────────────────┐
│ Replace the speaker unit. │
└──────────────┬───────────┘
               │
               ▼
┌──────────────────────────┐  Yes
│ Is sound output from the  ├────►
│ built-in speaker?         │
└──────────────┬───────────┘
               │ No
               ▼
┌──────────────────────────┐
│ Replace the Optical Engine│
│ and MA Board              │
└──────────────────────────┘
```

Can the volume be adjusted? — Yes / No

Replace the Optical Engine and MA Board

Can the audio output be started and stopped using the **[AV Mute]** button? — Yes / No

Replace the Optical Engine and MA Board

Control Panel

3.2.6 Control Panel

START

Does pressing the **[Power]** button turn the power on and off? — No

Yes

Does pressing the **[Menu]** button display the menu? — No

Yes

Does pressing the **[Source]** button switch the input source? — No

Yes

Does pressing the **[Help]** button show the explanation display? — No

Yes

Does pressing the **[Enter]** button change the menu item? — No

Yes

Does pressing the [⌐⌐⌐] or [⌐⌐⌐] buttons correct keystone distortion? — No

Yes

Does pressing the **[TELE]** or **[WIDE]** buttons change the image size? — No

Yes

Reconnect CN903 on the MA board

Yes — Do all switches function normally?

No

Replace the control panel.

Yes — Do all switches function normally?

No

Replace the Optical Engine and MA Board

Remote Control Operation

3.2.7 Remote Control Operation

START

Can the power be turned on and off using the remote control? — Yes

No

Replace the remote control battery.

Can the power be turned on and off using the remote control? — Yes

No

Replace the remote control.

Can the power be turned on and off using the remote control? — Yes

No

Replace the Optical Engine and MA Board

Do all buttons operate normally? — Yes

No

Replace the remote control.

Do all buttons operate normally? — Yes

No

Replace the Optical Engine and MA Board

Does the remote control work 20 ft. (6 m) away from the front or rear of the projector? — Yes

No

Replace the remote control battery.

Does the remote control work 20 ft. (6 m) away from the front or rear of the projector? — Yes

No

Replace the remote control.

Does the remote control work 20 ft. (6 m) away from the front or rear of the projector? — Yes

No

Replace the Optical Engine and MA Board

Other

3.2.8 Other

START

| Is the projector making abnormal noise? | Yes → | • Check for any objects around the Exhaust Fan, Intake Fan and Power Supply Fan.
• The cause might be a malfunction of the power supply unit (pulse transformer vibration, etc.). |

No ↓

| Is the projector overheating? | Yes → | • Malfunction of the Lamp Thermistor or Safety Switch.
• Malfunctioning or dirty Exhaust Fan, Intake Fan or Power Supply Fan. Clean or replace as necessary.
• Dirty air filter.
• Malfunction of the Optical Engine. |

No ↓

| Are there any image problems? | Yes → | • Malfunction of Optical Engine
  • Malfunctioning or dirty Light Guide Unit (lenses, mirrors, etc.).
  • Dirty Projection Lens.
  • Malfunctioning or dirty Light Valve. Replace the Optical Engine and MA Board |

No ↓

| Is there any abnormal odor or smoke? | Yes → | • Charring of cables due to excessive heat. Replace any damaged cables and resolve the overheating problem.
• Dust burning due to heat. Make sure the air filter is not damaged, and check for excessive heat. |

Chapter 4   Disassembly/Assembly

4.1 Overview

This chapter describes the procedures for disassembling and assembling the main components of the EMP-S3 projector. Unless otherwise specified, reassembly is the reverse of the disassembly procedure. Read the precautions described in the next section before starting.

4.1.1 Precautions

Some procedures require specific precautions that must be followed, and those will be noted throughout this chapter. Note the following precaution definitions:

WARNING

WARNING ⚡	Procedures which, if not strictly observed, could result in personal injury are described under the heading **WARNING**

CAUTION

CAUTION !	**CAUTION** signals a precaution which, if ignored, could result in damage to equip-ment.

REASSEMBLY

Reassembly ↩	If assembly needs special attention or the procedure is different from the reversed disassembly procedure, the correct procedure is described under the heading **REASSEMBLY**.

CHECK POINT

CHECK POINT ✓	Important tips for procedures are described under the heading **CHECK POINT.**

The precautions in the two lists below, WARNING and CAUTION, must always be followed during disassembly and assembly. Before starting the disassembly work on this product, read and follow these precautions.

WARNING

- No work should be performed on the unit by persons unfamiliar with basic safety measures as dictated for all electronics technicians in their line of work.

- Remove any metallic objects such as wristwatches, shirt cuff buttons, rings and tie pins which may pose a danger of coming into contact with the projector.

- Always wear gloves when disassembling and reassembling the projector.

- Disconnect the power cord from both the projector and the electrical outlet.

- If you need to work on the projector with power applied, strictly follow the instructions in this manual. When the power supply cable must be connected, use extreme caution in working on the power supply and other electronic components.

CAUTION

- Repairs on Epson product should only be performed by an Epson certified repair technician.

- Turn off the power for both the projector and the host computer before disconnecting or connecting them.

- Once all power has been turned off, disconnect any interface cables that are still connected.

- Use a vacuum cleaner to clean the air filter, interface panel and outer case.

- Use only recommended tools for disassembly, assembly or adjustment of the projector.

- Always verify that the product has been unplugged from the AC power source before disconnecting, removing, or replacing any cables or printed circuit boards.

- Use static discharge equipment such as anti-static wrist straps when accessing internal components to protect sensitive electronic components and circuitry.

- Do not use second source ICs or other components not approved by Epson. They could cause damage to the Epson product or could void the Epson warranty.

4.1.2 Tools and Equipment

The tools and equipment in the following table will be needed. All are commercially available, and should be made ready beforehand.

Table 4-1. Tools Needed

Name	Application
Phillips screwdriver No. 0	Disassembling the Focus ring
Phillips screwdriver No. 2 (20 cm)	Disassembling the outer case and inner components
Flathead screwdriver	Disassembling the rear foot and the front foot
Flathead precision screwdriver	Removing the front foot
Hexagonal box screwdriver (5 mm)	Removing the computer interface
Brush	Cleaning away dust
Vacuum cleaner	Cleaning away dust
Lens cleaner	Cleaning the projection lens
Air blower	Cleaning the light valves and fans
Gloves	Protection against sharp edges Antislip and static protection
Grounding strap	Anti-static protection
Heat-resistant tape	Securing cables

4.1.3 Projector-Specific Service Precautions

CHECK POINT ✔

The Optical Engine and Main (MA) Board are paired together as a single service part. Neither is available separately. For service that requires the replacement of either the MA Board or the Optical Engine, both components must be replaced together.

The component parts of the Optical Engine require mechanical installation positions to be adjusted in relation to each other. In addition, the control circuit also has its own unique characteristics, such as display signal output drivers, that differ from projector to projector. There are also unique differences in each optical system mechanism, such as in the light valves.

In order to obtain the optimum display, it is necessary to eliminate these differences in electrical and mechanical characteristics as well as to make mechanical adjustments. The various correction values are set at the time of shipment from the factory and are stored in ROM on the MA Board.

■ Always replace the Optical Engine and MA Board together as a matched pair.

■ Do not disassemble the Optical Engine.

■ Do not replace the component parts of the Optical Engine with parts from other Optical Engines.

Points to Note When Working

Detailed points to note are given in each section, so be sure to read each section thoroughly before beginning the disassembly procedure. Below are several general points which should be noted.

- When the projector is disassembled, the dust in and around parts such as the fans and air filter may get transferred to other parts such as the R, G and B light valves which are the central part of the display mechanism. This may have an adverse effect on the quality of projected images. Accordingly, check whether any of the parts are dusty or dirty, and use a vacuum cleaner to ***clean them first before carrying out disassembly work***.
- The Optical Engine and the circuit boards are very sensitive to static electricity. Place them inside static-proof bags once they have been removed from the projector.
- When carrying out any of the following operations, check that there is no dust or dirt on the respective components or on any lens and glass surfaces before installation. If any such contamination is found, clean it off using isopropyl alcohol.
  - Optical engine removal
  - Lamp inner unit removal
  - Air filter removal
- The speaker unit contains a permanent magnet, so keep it away from any storage media such as floppy disks and magnetic cards.
- The Optical Engine is very sensitive to vibration and shocks, so handle it with care.
- Do not disassemble any components (such as the power supply unit) which do not have express disassembly procedures described in this Service Manual.

4.2 Projector Disassembly and Assembly

The general disassembly procedure for the EMP-S3 projectors is illustrated below. Except where indicated separately, all reassembly should be carried out by following the disassembly procedures in reverse. Detailed disassembly procedures for each component are given in Sections 4.2.1 to 4.2.19,
links to which are given in the flowchart below.

```
                              ┌─────────────┐
                              │  Projector  │
                              └──────┬──────┘
                    ┌────────────────┴────────────────┐
          ┌──────────────────┐              ┌──────────────────────┐
          │ LID ASSY., LAMP  │              │ MODEL NAME PLATE;    │
          │     (4.2.2)      │              │    PowerLiteS3       │
          └────────┬─────────┘              │      (4.2.1)         │
                   │                        └──────────────────────┘
          ┌──────────────────┐
          │ Lamp inner unit  │
          │     (4.2.2)      │
          └────────┬─────────┘
```

LENS CAP UNIT (4.2.3)	CASE, UPPER; AE (4.2.7)	FRAME, AIR FILTER (4.2.6)	FOOT UNIT, FRONT (4.2.5)	FOOT, REAR (4.2.4)

AIR FILTER; A (4.2.6) — under FRAME, AIR FILTER
FOOT RUBBER (4.2.4) — under FOOT, REAR

SHEET, SHADING, SW1 (4.2.8)	PRINTED CIRCUIT BOARD ASSEMBLY; MA_R1 (4.2.9)	FILTER, RC (4.2.8)	CUSHION, UPPER (4.2.8)	CUSHION, PS (4.2.8)	SHEET, CASEUPPER (4.2.8)

PRINTED CIRCUIT BOARD ASSEMBLY; SW_R1 (4.2.8)	Optical engine and MAB set (4.2.12)	PRINTED CIRCUIT BOARD ASSEMBLY; RC_R1 (4.2.15)	SET, CASE, IF (4.2.10)

CABLE SW (4.2.8)
CABLE RCR; FIF (4.2.15)
FILTER, RC (4.2.10) | SHEET, SHADING, SW2 (4.2.10)

BUTTON, SW (4.2.8)
PLATE, MA (4.2.11)

FOCUS, RING (4.2.13)	DUCT, INTAKE (4.2.15)	fan80 (4.2.16)

KNOB, PROJECTION LENS (4.2.13) | FAN,INTAKE (BG0703-B044) (4.2.15) | DUCT, EXHAUST, OUTER (4.2.16)

PROJECTION LENS (4.2.14) | FAN,INTAKE (BG0703-B044-00L-E1) (4.2.15) | PRINTED CIRCUIT BOARD ASSEMBLY; TH_R1 (4.2.17)

Cable Assy RC; FIF (4.2.17)

Lamp Cover Detection Switch (4.2.17)

DUCT, EXHAUST, INNER (4.2.17)

POWER SUPPLY ASSY. (4.2.18)

SHIELD PLATE, LAMP (4.2.19)

CASE, LOWER (4.2.19)

> **CHECK POINT** ✔
> Part names indicated in the above flow and used in this chapter are simplified names. See the "Part Names given in the SPI" table on the next page to know their corresponding official names.

Figure 4-1.

The table below shows the part names used in this chapter and their official names given in the After Service Part List in the SPI (Service Part Information).

Table 4-2. Part Names given in the SPI

Official Name used in SPI	Names used this Chapter
MODEL NAME PLATE; PowerLiteS3	EMP-S3 Model Name Plate
Lamp inner unit	Lamp Assy.
LID ASSY., LAMP	Lamp Lid Assy
LENS CAP UNIT	Lens Cap Unit
FOOT, REAR	Rear Foot
FOOT RUBBER	Foot Rubber
FOOT UNIT, FRONT	Front Foot Unit
FRAME, AIR FILTER	Air Filter Frame
AIR FILTER; A	Air Filter, A
CASE, UPPER; AE	Upper Case
FILTER, RC	RC Filter
SHEET, SHADING, SW1	SW1 Light Shade Sheet
CUSHION, UPPER	Upper Cushion
CUSHION, PS	PS Cushion
PRINTED CIRCUIT BOARD ASSEMBLY; SW_R1	SW Board Assy.
BUTTON, SW	SW Button
CABLE SW	SW Cable
SHEET, CASEUPPER	Upper Case Sheet
PRINTED CIRCUIT BOARD ASSEMBLY; MA_R1	MA Board Assy.
SET, CASE, IF	IF Case Set
FILTER, RC	RC Filter
SHEET, SHADING, SW2	SW2 Light Shade Sheet
PLATE, MA	MA Plate
Optical engine and MAB set	Optical Engine
FOCUS, RING	Focus Ring
KNOB, PROJECTION LENS	Projection Lens Knob
PROJECTION LENS	Projection Lens Unit
PRINTED CIRCUIT BOARD ASSEMBLY; RC_R1	RC Board Assy.
DUCT, INTAKE	Intake Duct
FAN,INTAKE (BG0703-B044)	Intake Fan
FAN,INTAKE (BG0703-B044-00L-E1)	Intake Fan
CABLE RCR; FIF	Cable RCR, FIF
fan80	Fan 80
DUCT, EXHAUST, OUTER	Outer Exhaust Duct
Cable Assy RC; FIF	Cable Assy RC, FIF
DUCT, EXHAUST, INNER	Inner Exhaust Duct
PRINTED CIRCUIT BOARD ASSEMBLY; TH_R1	TH Board Assy.
Lamp Cover Detection Switch	Lamp Cover Detection Switch
POWER SUPPLY ASSY.	Power Supply Assy.
CASE, LOWER	Lower Case
SHIELD PLATE, LAMP	Lamp Shield Plate

4.2.1 Removing the Model Name Plate

Remove the EMP-S3 Model Name Plate.

4.2.2 Removing the Lamp Lid Assy and Lamp Assy.

1. Remove the screw that secures the Lamp Lid Assy., and remove the Lamp Lid Assy.

2. Remove the two screws that secure the Lamp Assy, and remove the Lamp Assy.
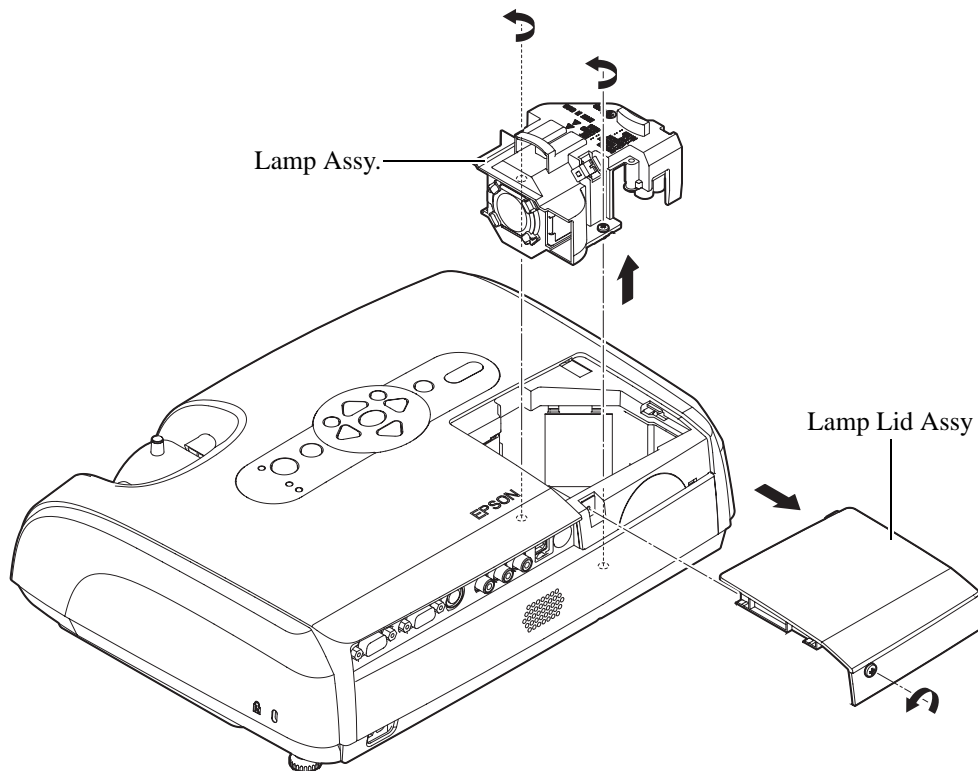
Figure 4-2.

4.2.3 Removing the Lens Cap Unit

1. Remove the string that attaches the Lens Cap Unit to the projector body to take off the Lens Cap Unit.

Lens Cap Unit
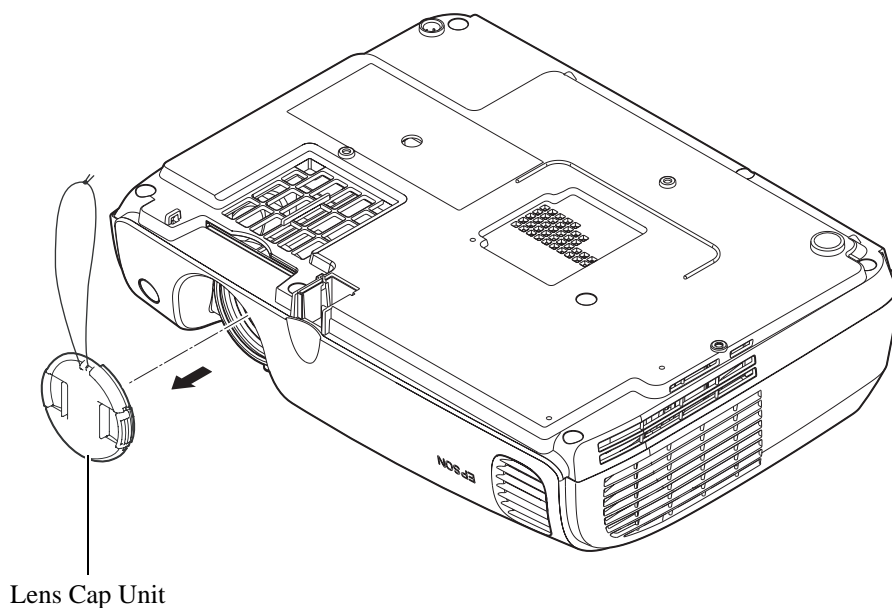
Figure 4-3.

4.2.4 Removing the Rear Foot/Foot Rubber

1. Extend the legs of the Rear Foot as far as they will go.

2. Pull and rotate the Rear Foot to remove the Rear Foot.

3. Press a screwdriver or similar tool into the small slot beside the Rear Foot and pry the Foot Rubber out of the projector Lower Case Unit.

Foot Rubber

Rear Foot
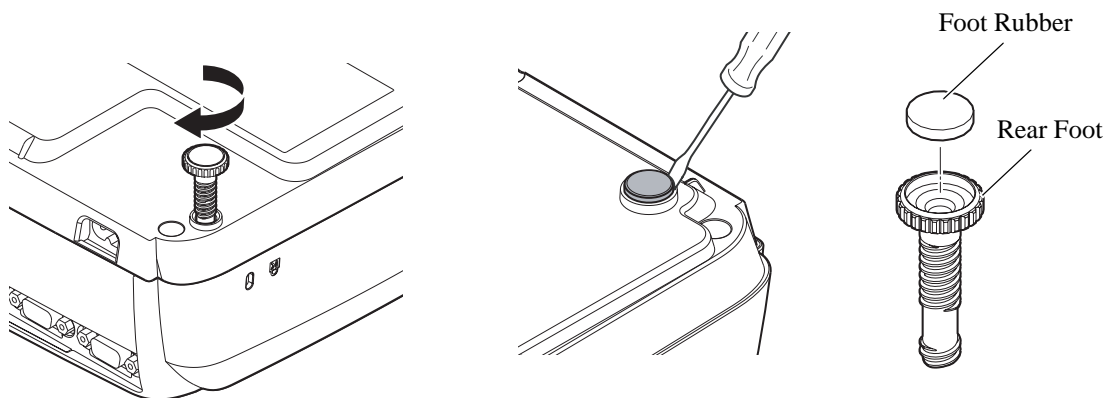
Figure 4-4.

4.2.5 Removing the Front Foot Unit

1. Press a screwdriver or similar tool into the small slot beside the Front Foot Unit, and take out the Front Foot Unit.

Front Foot Unit
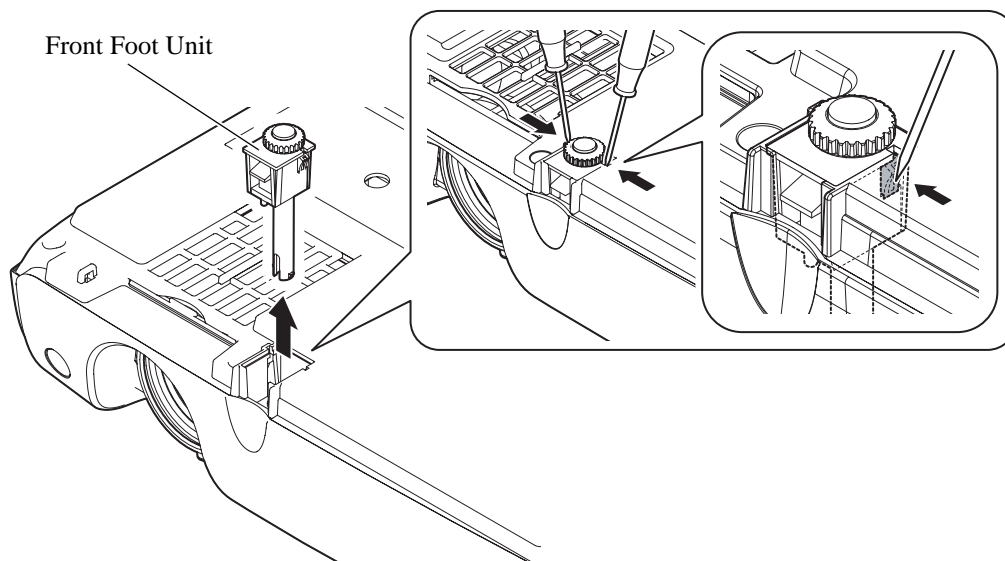
Figure 4-5.

4.2.6 Removing the Air Filter Frame and Air Filter, A

1. Slide the Air Filter Frame in the direction of the arrow with your fingers, and remove the Air Filter Frame.

2. Remove the Air Filter, A from the Air Filter Frame.

Air Filter, A

Frame, Air Filter
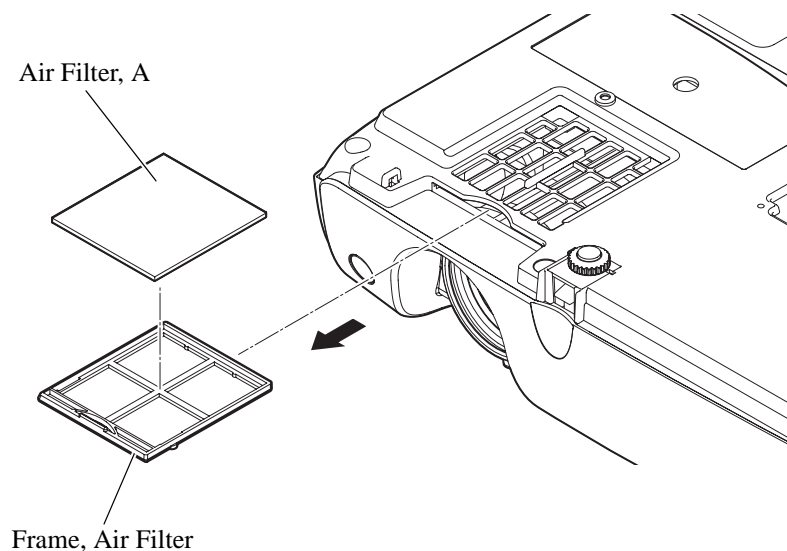
Figure 4-6.

4.2.7 Removing the Upper Case

1. Remove the 7 (C.B.P-TITE, 3x10, F/ZB-3C) screws that secure the Upper Case Unit.
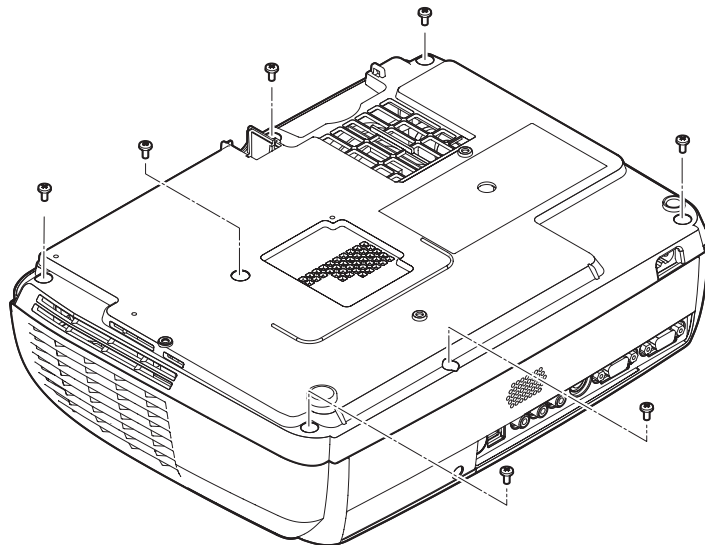
Figure 4-7.

2. Carefully lift the front of the Upper Case taking care not to pull the one cable connected to the Upper Case.
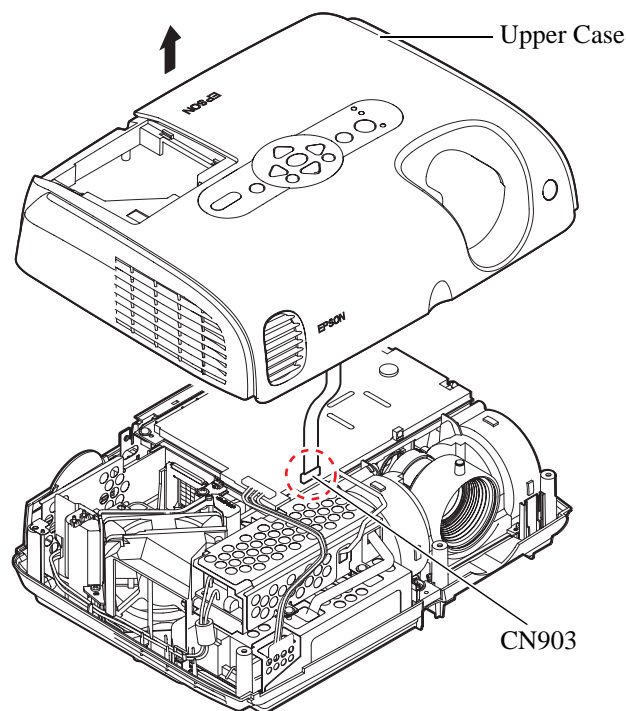
Figure 4-8.

3. Unlock connector CN903 on the MA Board and then disconnect the Control Panel Cable.
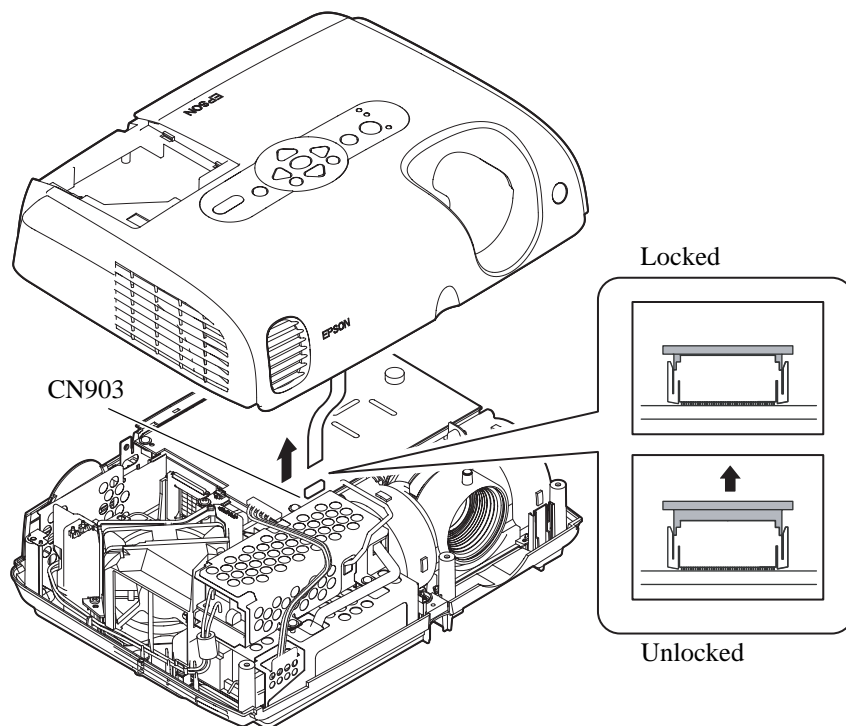
Figure 4-9.

4.2.8 Removing the RC Filter, Upper Cushion, PS Cushion, SW1 Light Shade Sheet, SW Board Assy, SW Cable, and Upper Case Sheet

1. Detach the RC Filter from the Upper Case.

2. Detach the Upper Cushion from the Upper Case.

3. Remove the PS Cushion from the Upper Case.

4. Remove the SW1 Light Shade Sheet from the SW Board Assembly.

5. Remove the 4 (C.C.P-TITE, 3x6, F/ZN-3C) screws to remove the SW Board Assembly.

6. Unlock connector H179 and disconnect the SW Cable.

7. Remove the SW Button.

8. Remove the Upper Case Sheet from the Upper Case.
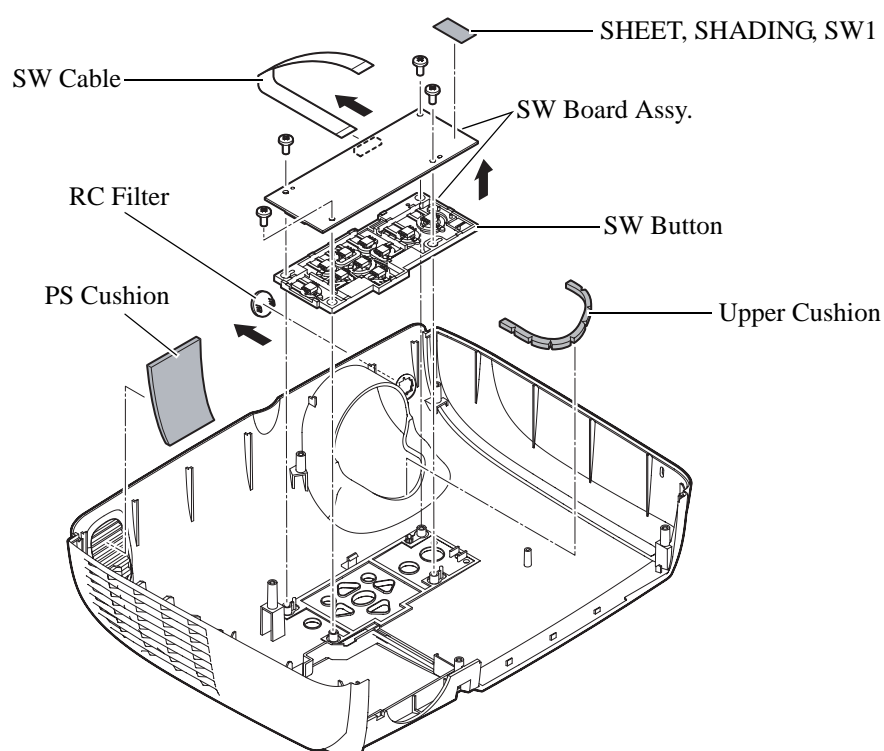
Figure 4-10.

CAUTION

■ When attaching the Upper Case Sheet to the Upper Case, follow the instruction below.

1). Attach the two sheets to the positions indicated in the figure below with their precut side facing downward.
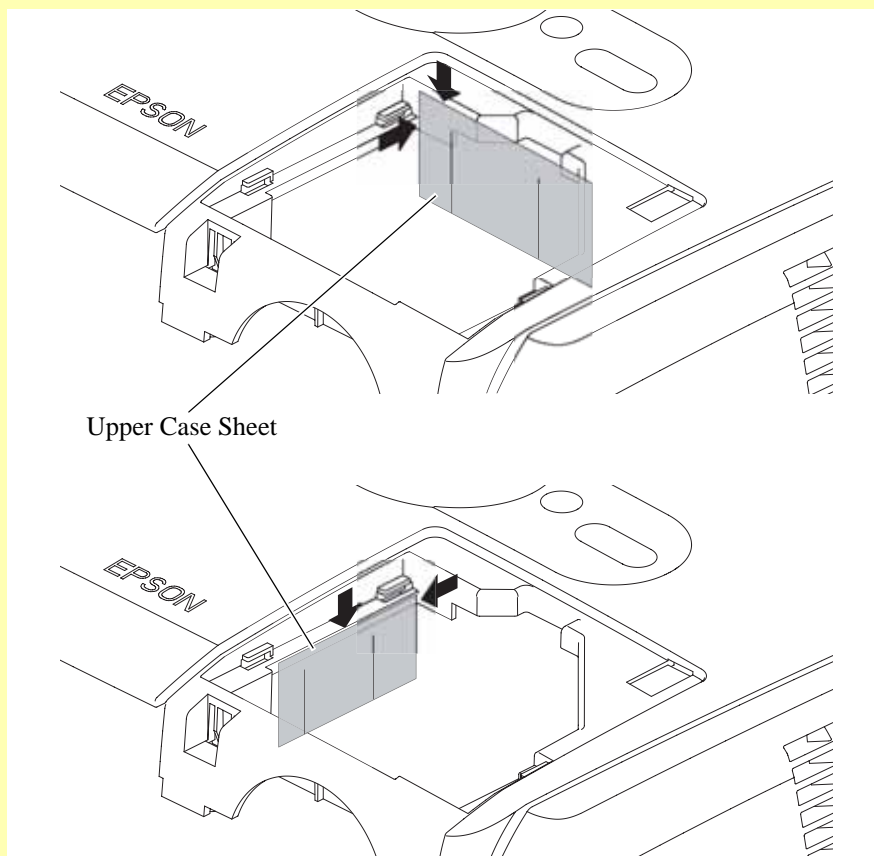
Upper Case Sheet

Figure 4-11.

2). Fold the sheets along the edges of the Upper Case and attach them firmly to the backside of the case so as not to form any clearance or wrinkles.

Upper Case Sheet
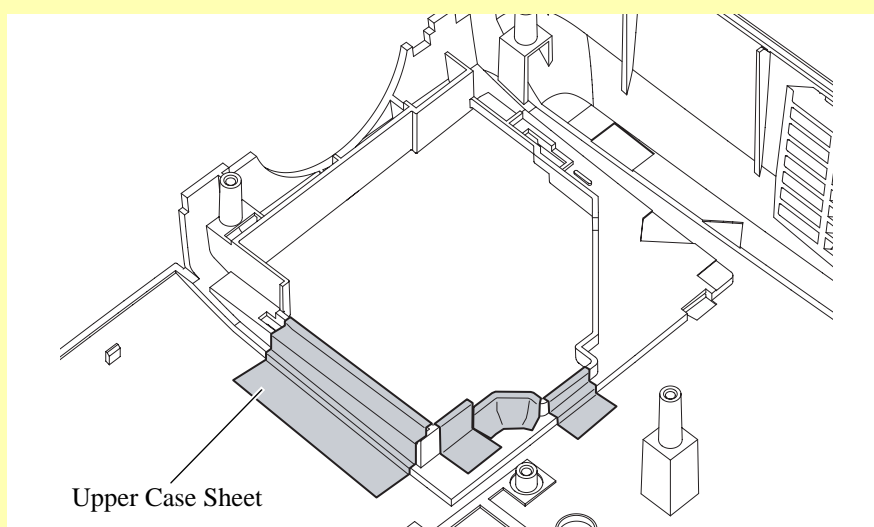
Figure 4-12.

<div style="border: 2px solid; background: yellow;">

CAUTION ⚠️

■ After connecting the SW Cable, aslant to fold and secure it with a piece of heat resistant tape as shown in the figure. Make sure that the fold is kept 1 cm away from the SW Board Assy.

PRINTED CIRCUIT BOARD
ASSEMBLY; SW_R1

1cm

cable sw

Heat-Resistant Tape
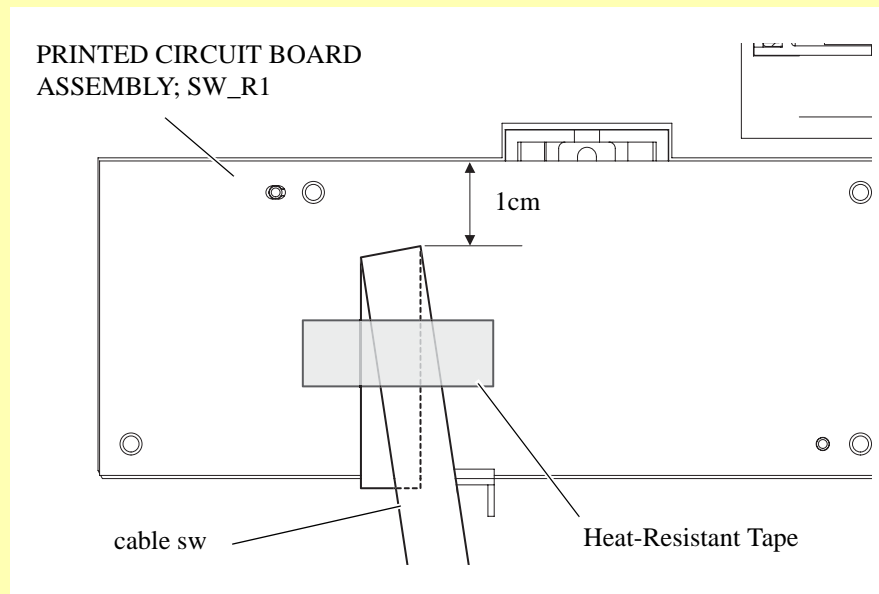
Figure 4-13.

</div>

4.2.9 Removing the MA Board Assy.

1. Unlock the connectors of the Light Valve R/G/B connection cables.
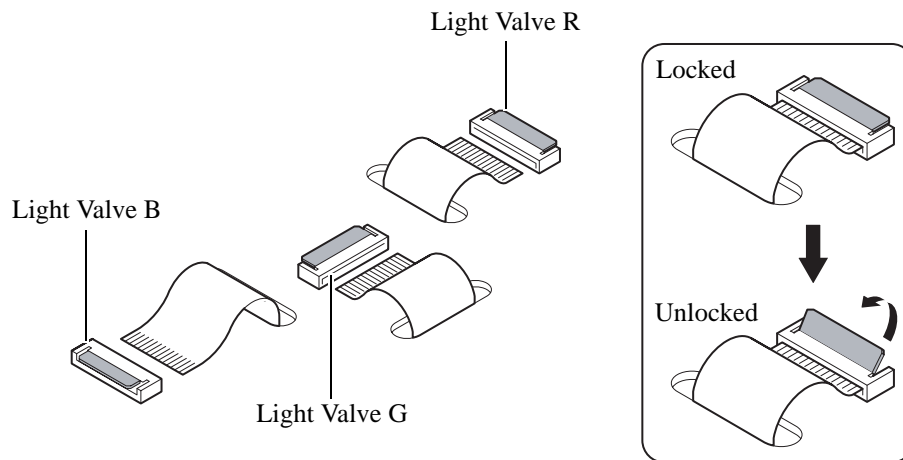
Figure 4-14.

2. Disconnect the Light Valve R/G/B connection cables and 9 cable connectors that are connected to the MA Board.
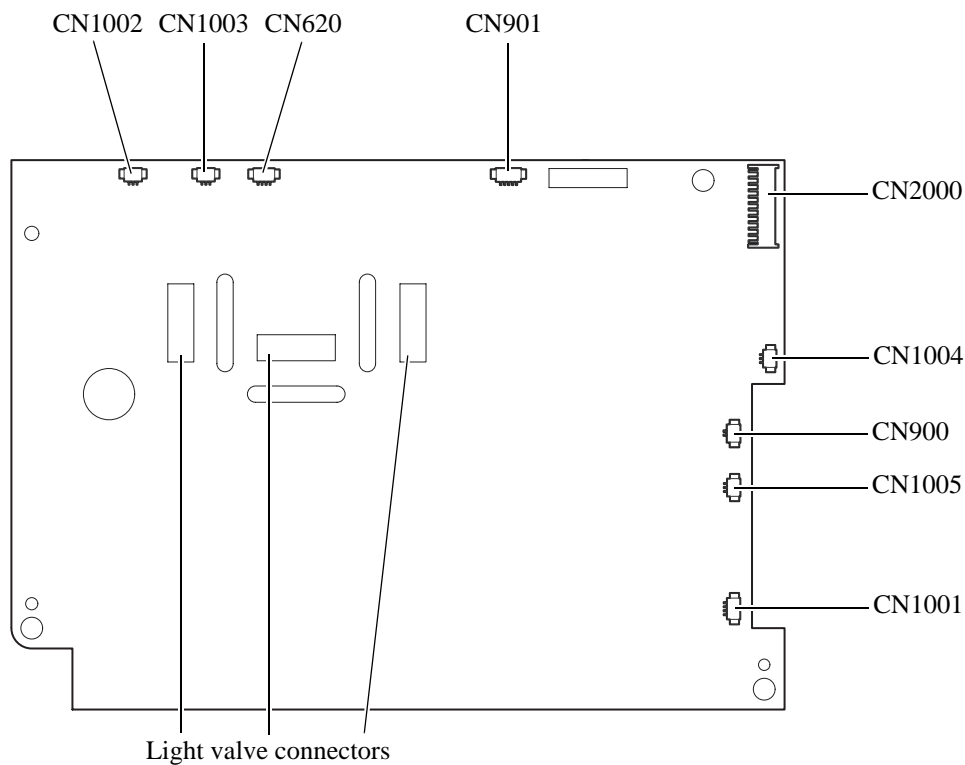
Figure 4-15.

3. Remove the (C.C., 3x6, F/ZN-3C) screw to remove the MA Board Assy.
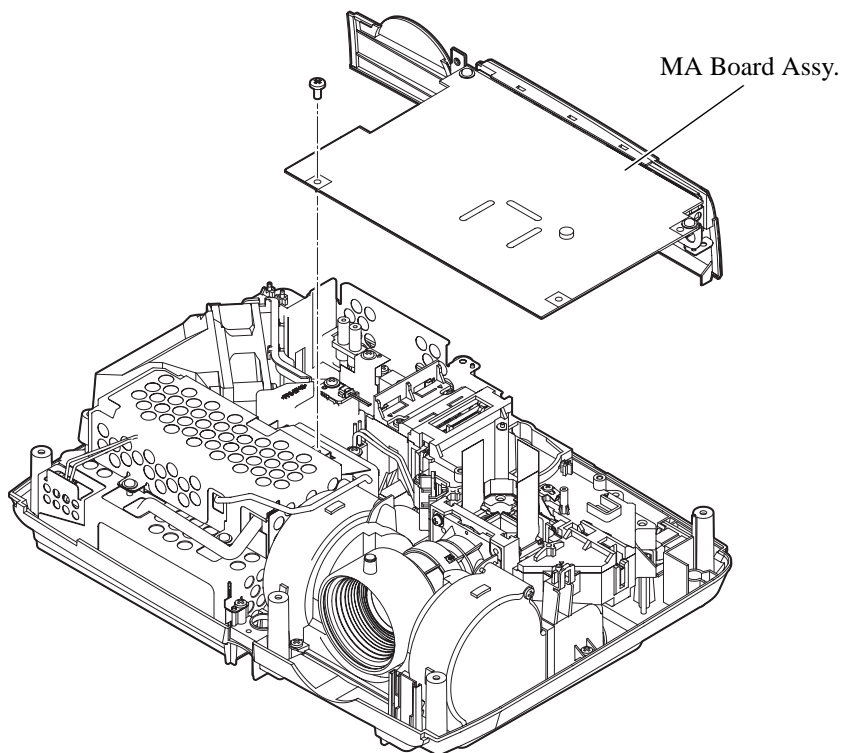
MA Board Assy.

Figure 4-16.

CAUTION !	■ When installing the MA Board Assy., pay attention to the followings.
	1). As the cable of the Intake Fan 2 is long, press the cable into the clearance between the Power Supply Fan Assembly and the Intake Fan 2. Tuck down the cable of the RCR Cable, FIF downward so as not to disturb the installation.

Intake Fan 2 Cable   RCR Cable, FIF
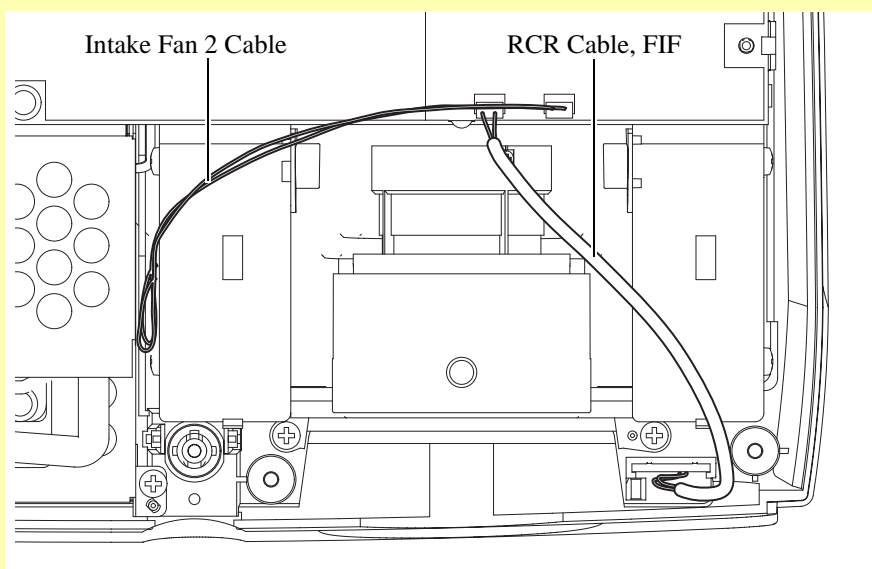
Figure 4-17.

CAUTION

!

2). Route the Power Supply Fan Cable as shown in Figure 4-18, and press into the cable under the MA Board as far as it will go.

Power Supply Fan Cable
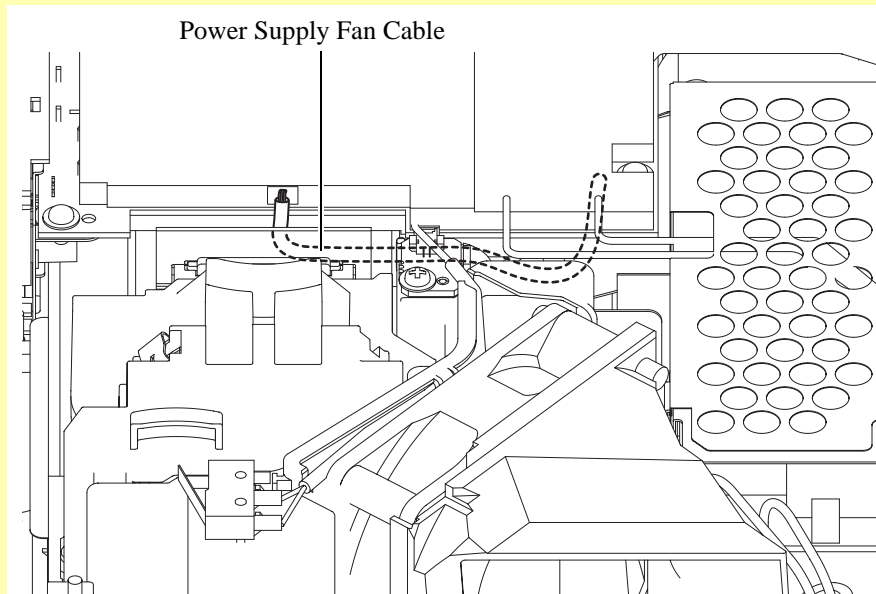
Figure 4-18.

3). Route the cable of the Intake Fan 1 as shown in Figure 4-19.

Intake Fan 1 Cable
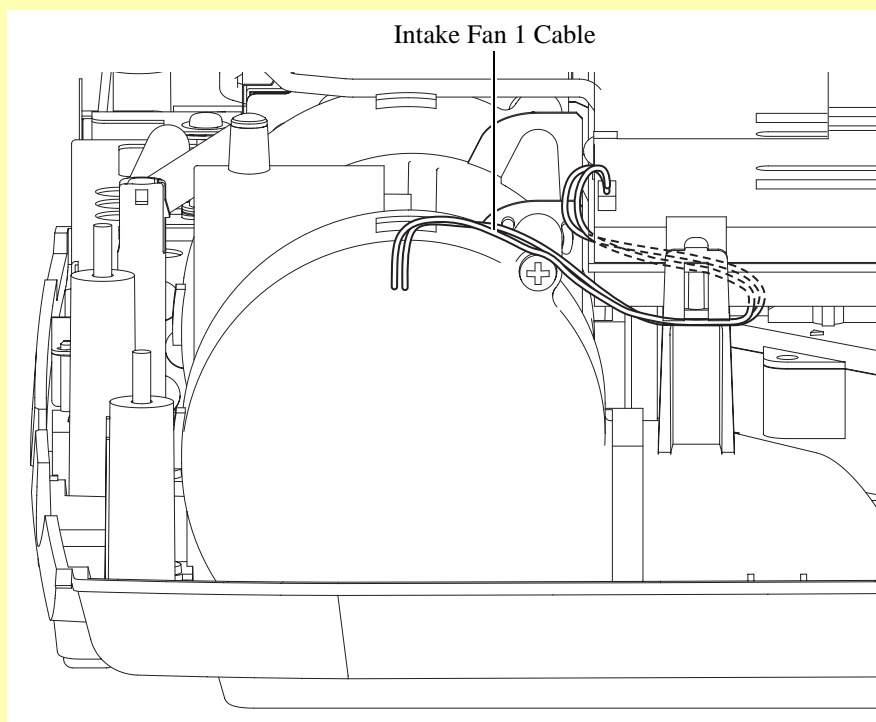
Figure 4-19.

CAUTION

!

4). Route the power cord as shown in Figure 4-20, and secure the cable with a heat-resistant tape. Gently squeeze the Power Supply Ballast Cable into the Power Supply Unit.

Heat-Resistant Tape

Power Cord   Power Supply Ballast Cable
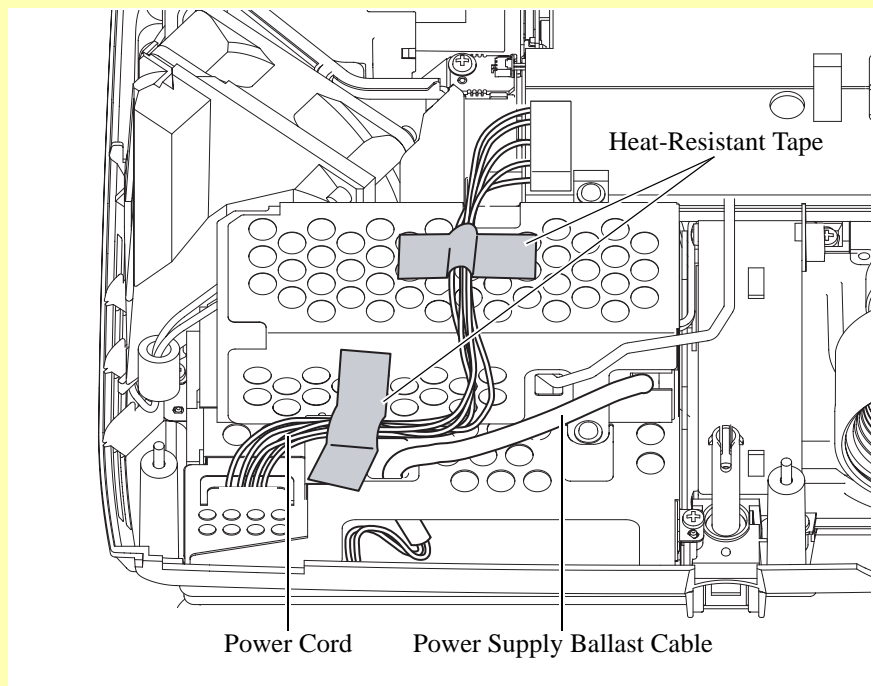
Figure 4-20.

4.2.10 Removing the IF Case Set, RC Filter and SW2 Light Shade Sheet

1. Remove the SW2 Light Shade Sheet from the IF Case Set.

2. Remove the 2 (C.B.P-TITE, 3x10, F/ZB-3C) screws that secure the IF Case Set, disconnect the Speaker Cable from connector CN1701 on the MA Board, and remove the IF Case Set from the MA Board Assy.

3. Remove the Remote Control (RC) Filter from the IF Case Set.
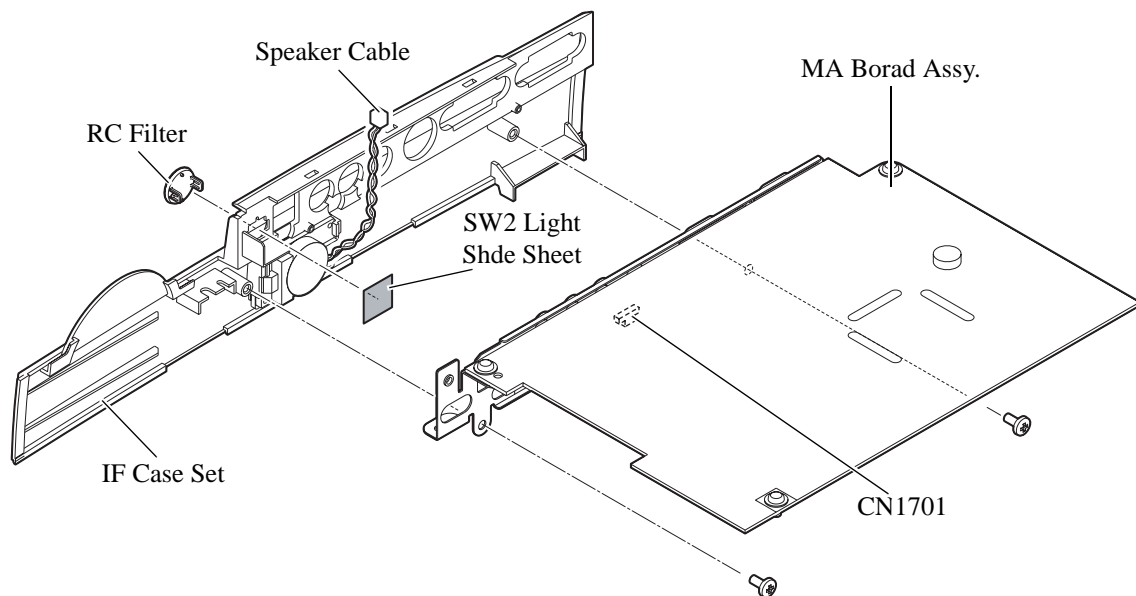
Figure 4-21.

4.2.11 Removing the MA Plate

1. Remove the 2 (C.B.P-TITE, 3x10, F/ZB-3C) screws that secure the RCA connector, the (C.B.P-TITE, 3x10, F/ZB-3C) screw that secures the USB connector, and the 4 (HSH 4-40) screws that secure D-sub 15 Pin connectors.

2. Remove the 2 (C.C., 3x6, F/ZN-3C) screws that secure the MA Plate to the MA Board, and remove the MA Plate from the MA Board Assembly.
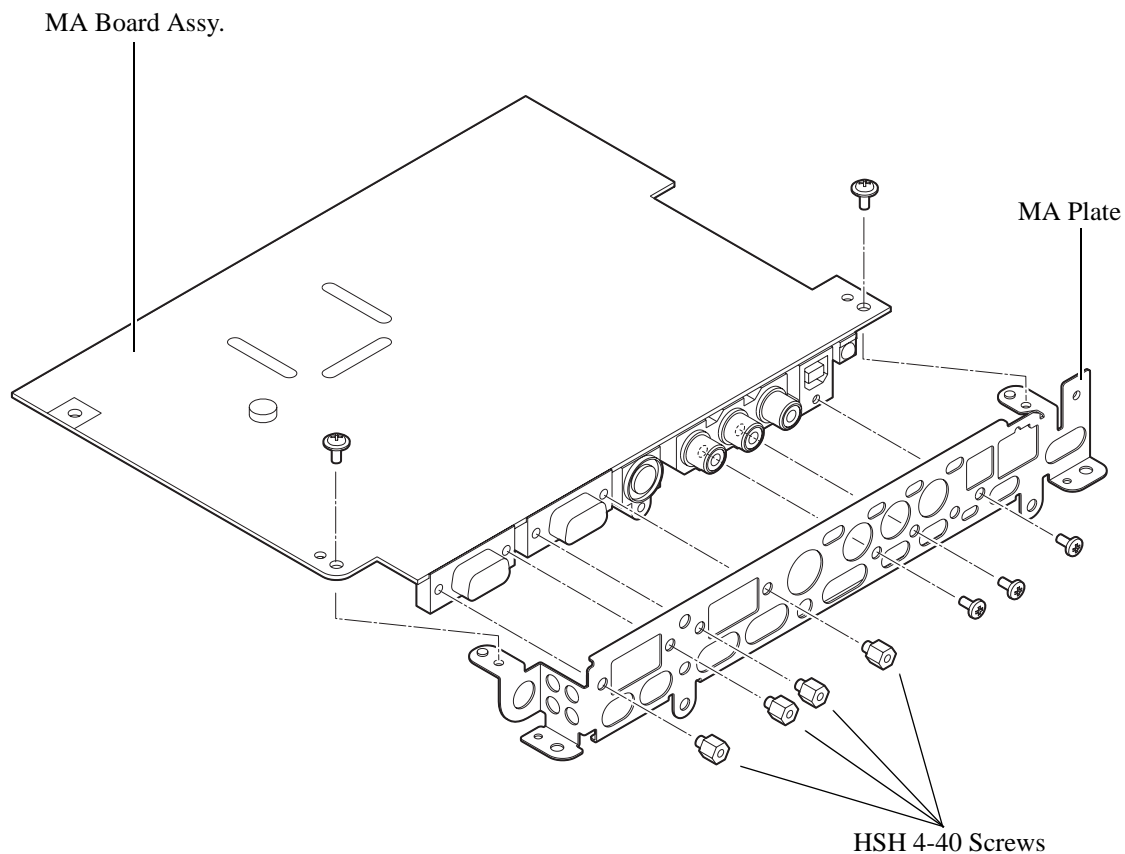
MA Board Assy.

MA Plate

HSH 4-40 Screws

Figure 4-22.

4.2.12 Removing the Optical Engine

1. Remove the 4 (C.B.P-TITE, 3x10, F/ZB-3C) screws that secure the Optical Engine, and remove it.

Screw
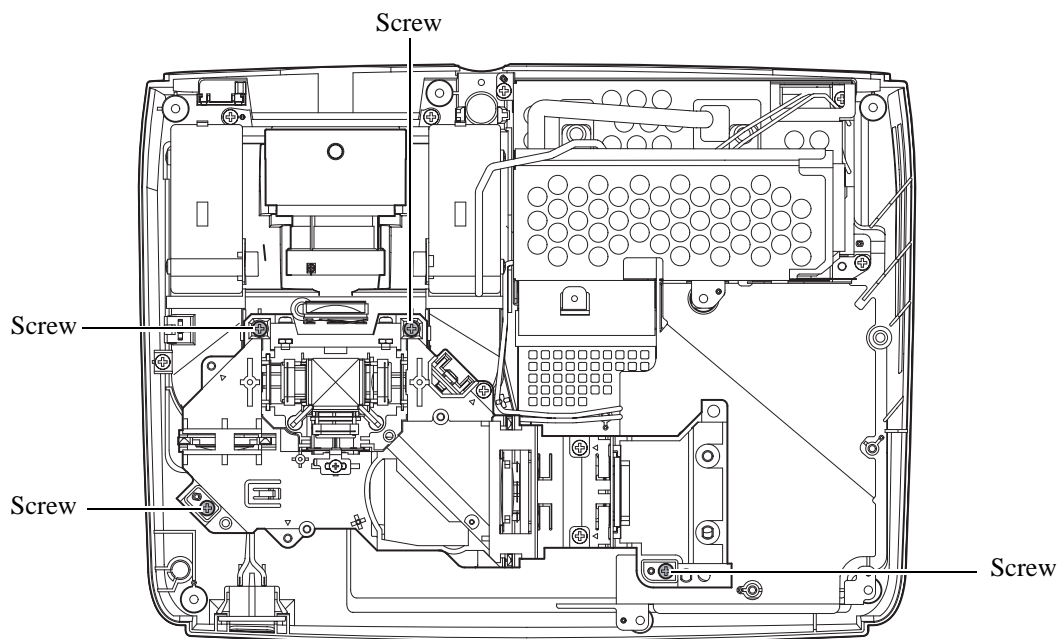
Screw

Screw

Screw

Figure 4-23.

4.2.13 Removing the Focus Ring and Projection Lens Knob

1. Remove the 4 (C.P.TYPE1 B- TITE- A., 2x6, F/ZB- 3C) screws that secure the Ring, and remove the Ring from the Projection Lens Unit.

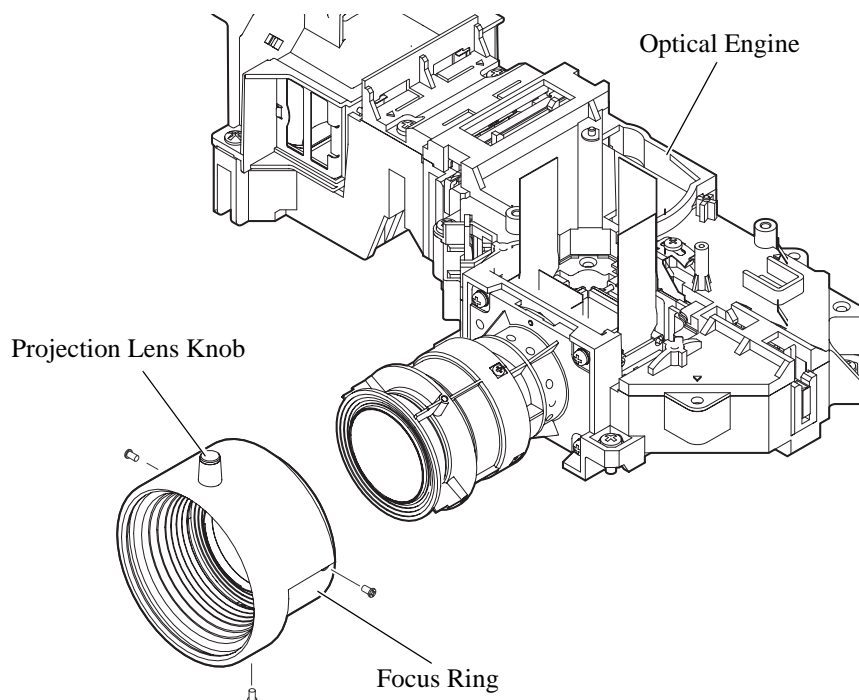2. Remove the Projection Lens Knob from the Ring.

Optical Engine

Projection Lens Knob

Focus Ring

Figure 4-24.

4.2.14 Removing the Projection Lens Unit

1. Remove the 4 (C.P.(S-P1), 3x10, F/ZN-3C) screws that secure the Projection Lens Unit, and remove the Projection Lens Unit from the Optical Engine.

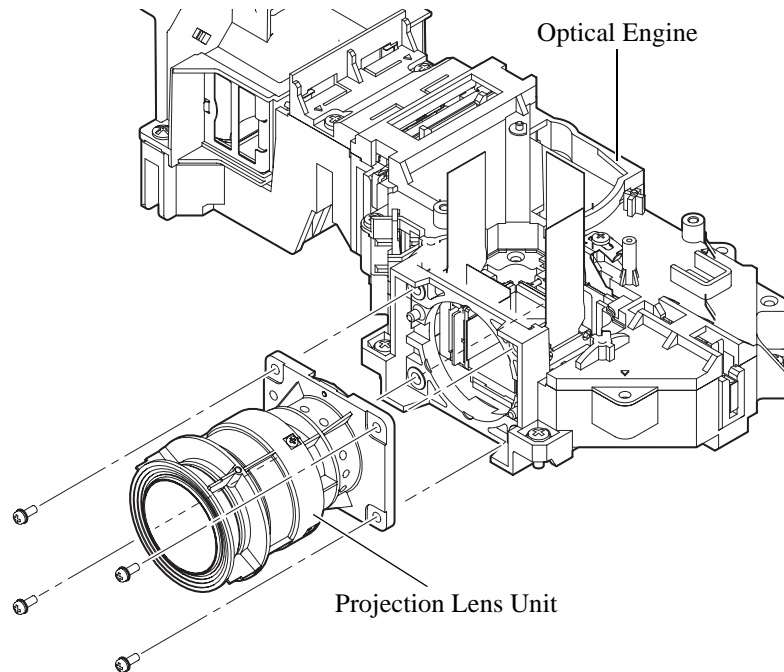2. Remove the (H.N.-3, F/ZN-3C) screw nut from the Optical Engine.

Figure 4-25.

4.2.15 Removing the RC Board Assy, Cable RCR, Safety Switch, Intake Duct, Intake Fan (BG0703-B044), and Intake Fan (BG0703-B044-00L-E1)

1. Remove the RC Board Assy (Printed Circuit Board Assy, RC_S2), and disconnect the Cable RCR, FIF from the RC Board Assembly.

2. Remove the (C.C.P-TITE, 3x8, F/ZN-3C) screw that secures the Safety Switch, and remove the Safety Switch from the Inner Exhaust Duct.

3. Remove the 5 (C.B.P-TITE, 3x10, F/ZB-3C) screws that secure the Intake Duct to remove it.

4. Remove the 4 (C.B.P-TITE, 3x35, F/ZN-3C) screws that secure the Intake Fans, and remove the Intake Fans (BG0703-B044 and BG0703-B044-00L-E1).
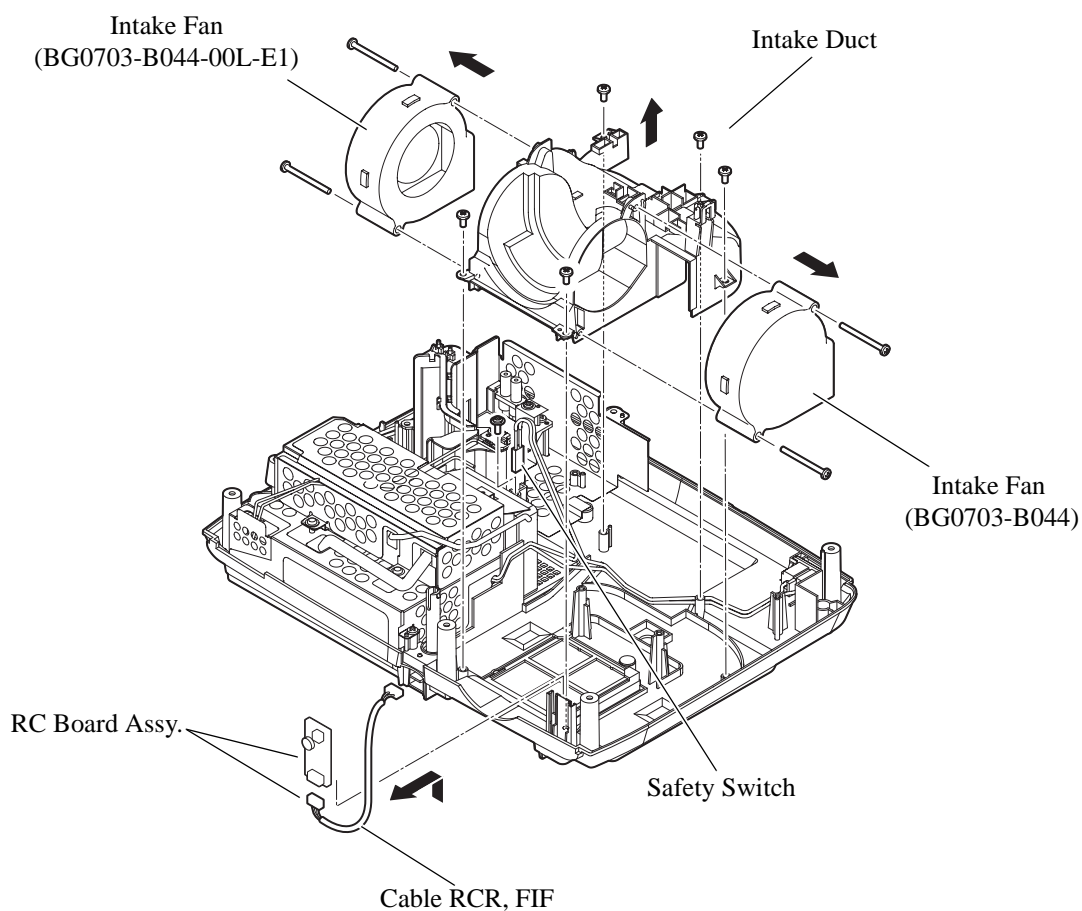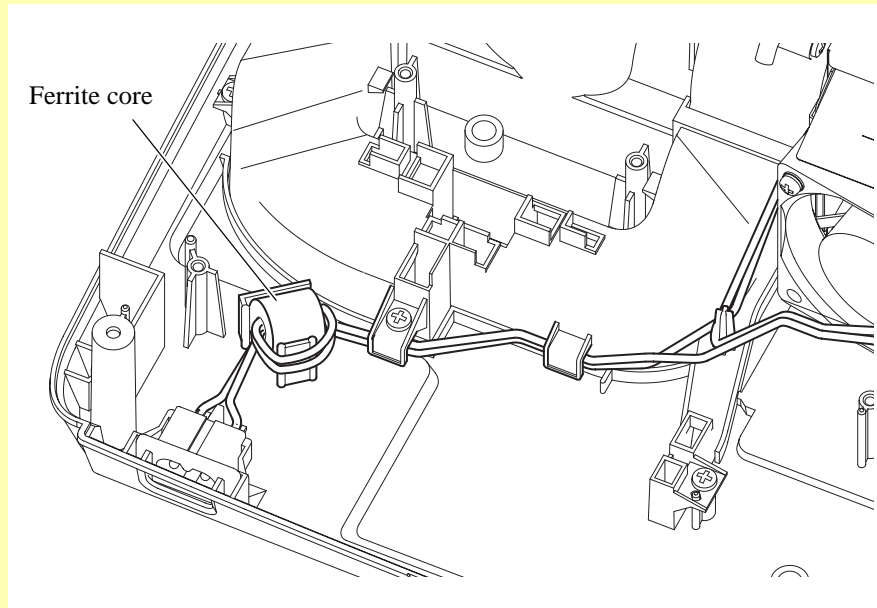

Figure 4-26.

CAUTION
!

■ Route the AC Inlet Cable as shown in the figure below, and secure the ferrite core on the tab of the Lower Case.

Ferrite core

Figure 4-27.

4.2.16 Removing the Exhaust Fan Assy, Fan 80, and Outer Exhaust Duct

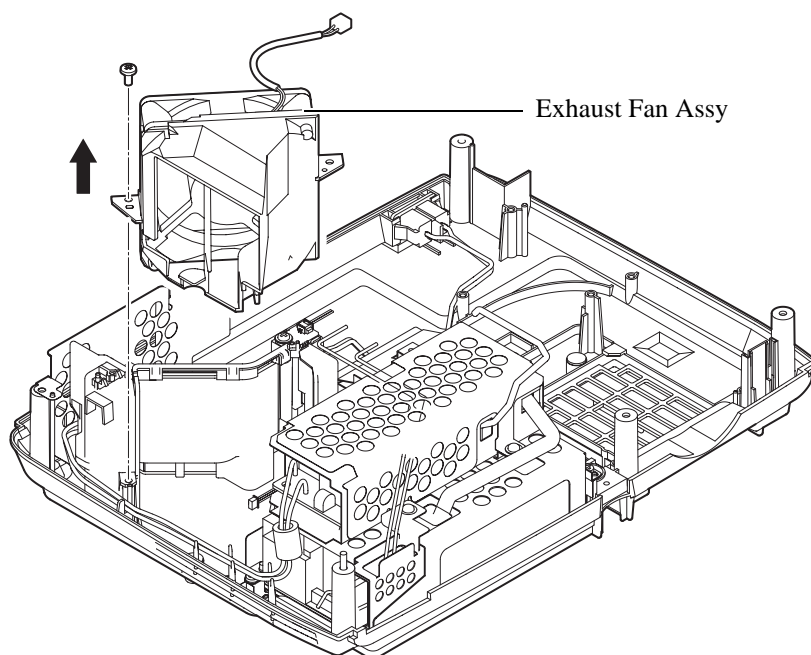1. Remove the (C.B.P-TITE, 3x10, F/ZB-3C) screw that secures the Exhaust Fan Assy and remove it.

Exhaust Fan Assy

Figure 4-28.

CAUTION

■ When installing the cable of both the Lamp Lid Detection Switch and the Exhaust Fan, route them as shown in Figure 4-29.
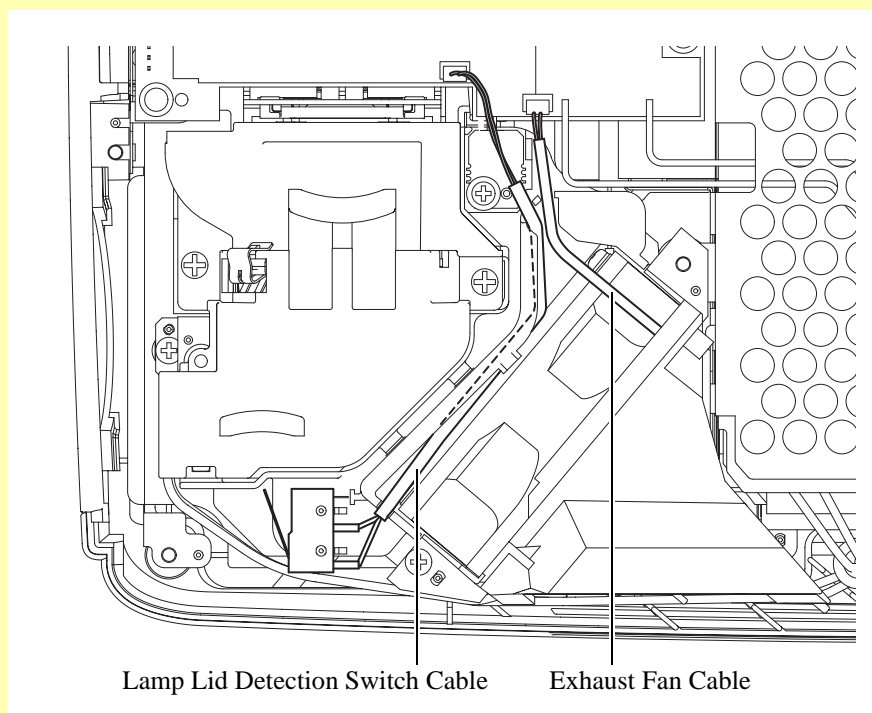

Lamp Lid Detection Switch Cable   Exhaust Fan Cable

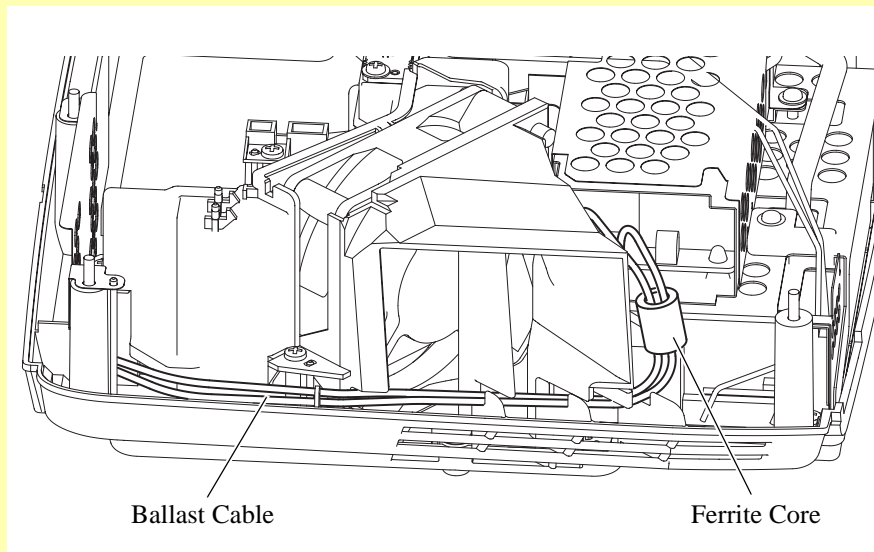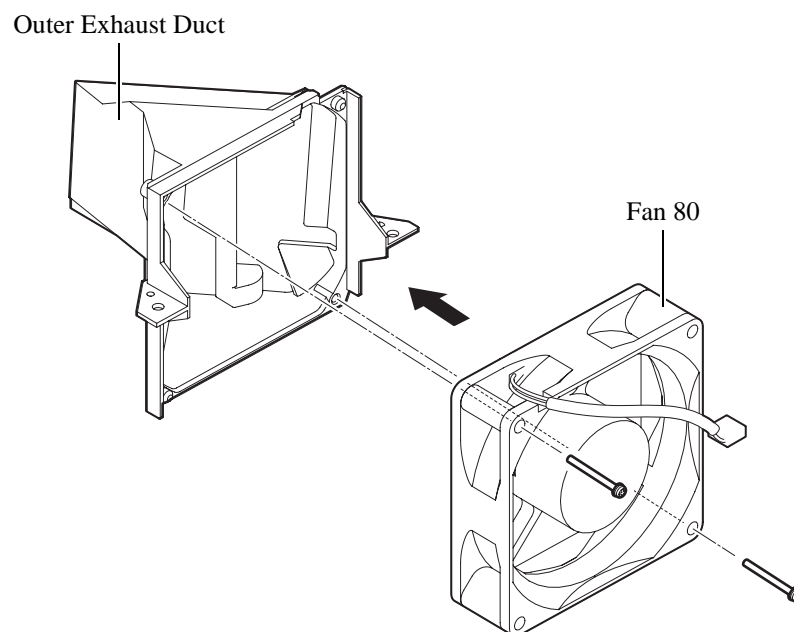**Figure 4-29.**

■ When installing the Ballast Cable, route the cable and move the ferrite core into the position as shown in Figure 4-30.

Ballast Cable   Ferrite Core

Figure 4-30.

2. Remove the 2 (C.B.P-TITE, 3x30, F/ZN-3C) screws that secure Fan 80, and remove the Outer Exhaust Duct from the Exhaust Fan Assy.

Outer Exhaust Duct

Fan 80

Figure 4-31.

4.2.17 Removing the TH Board Assy, Cable Assy RC, Lamp Cover Detection Switch, and Inner Exhaust Duct

1. Remove the (C.C.P-TITE, 2x12, F/ZN-3C) screw that secure the Lamp Cover Detection Switch, and remove the Lamp Cover Detection Switch from the Inner Exhaust Duct.

2. Remove the (C.C.P-TITE, 3x8, F/ZN-3C) screw that secures the TH Board Assy (Printed Circuit Board Assy, TH_S2), and remove the TH Board Assy from the Inner Exhaust Duct.

3. Remove the Cable Assy RC, FIF from the TH Board Assy.

4. Remove the (C.C.P-TITE, 3x8, F/ZN-3C) screw that secures the Lamp Connector, and remove the Lamp Connector from the Inner Exhaust Duct.

5. Remove the 2 (C.B.P-TITE, 3x10, F/ZB-3C) screws to remove the Inner Exhaust Duct.
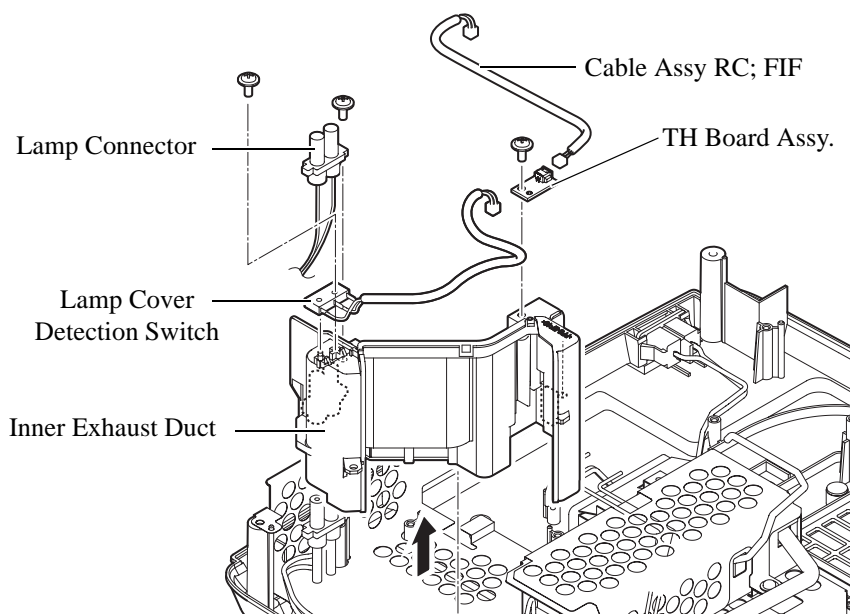
Figure 4-32.

4.2.18 Removing the Power Supply Assy.

1. Remove the heat-resistant tape that secures the Power Supply Cable.

2. Remove the 1 screws that secure the Plate Power Supply Cable, and remove the Plate Power Supply Cable.

3. Remove the Ballast Shield Plate.

4. Remove the 4 (C.B.P-TITE, 3x10, F/ZB-3C) screws that secure the Power Supply Assy. and remove the Power Supply Assy.. Extra caution is required as one of the screws is located underneath the Insulation Plate Ballast.

Figure 4-33.

4.2.19 Removing the Lamp Shield Plate and Lower Case

1. Remove the Lamp Shield Plate from the Lower Case.

Lamp Shield Plate

Lower Case

Figure 4-34.

Chapter 5   Appendix

> **CAUTION** ⚠️ The contents of this chapter are for use only by Epson Authorized Servicers, and are not to be disclosed to others without the express written consent of Epson.
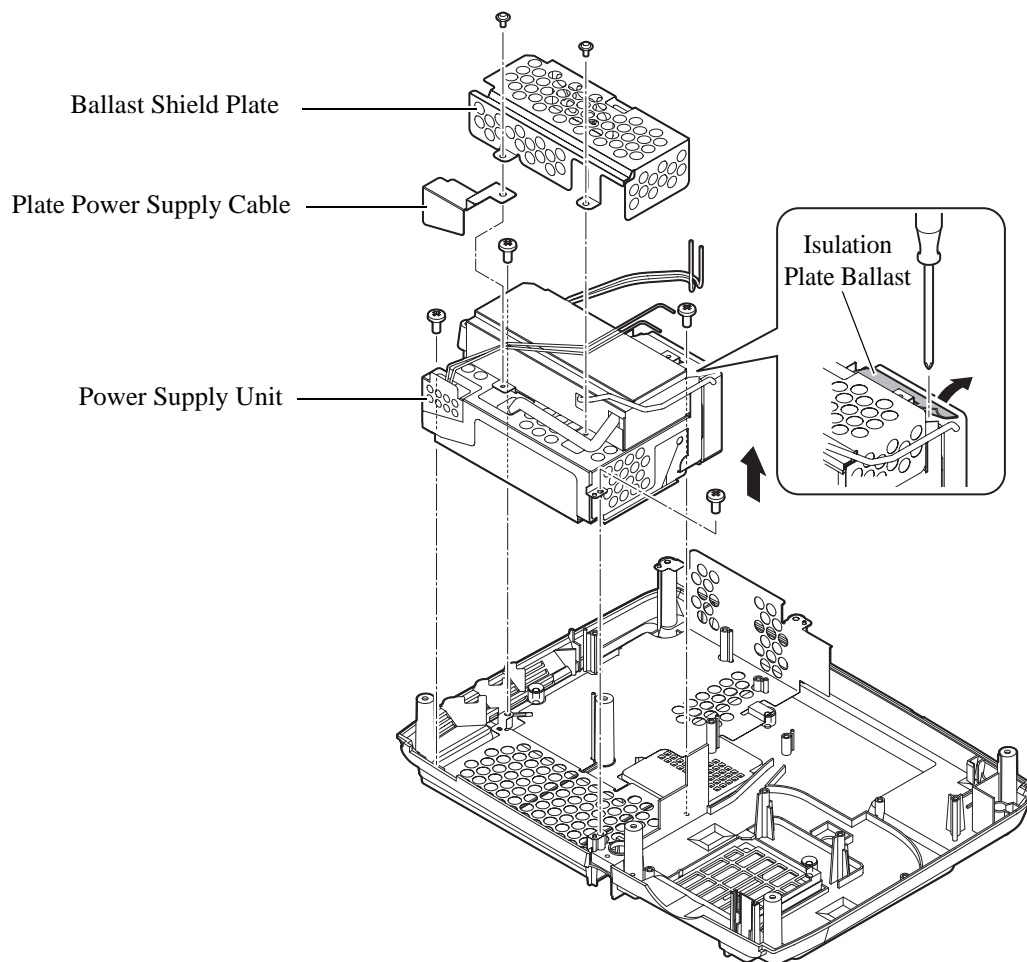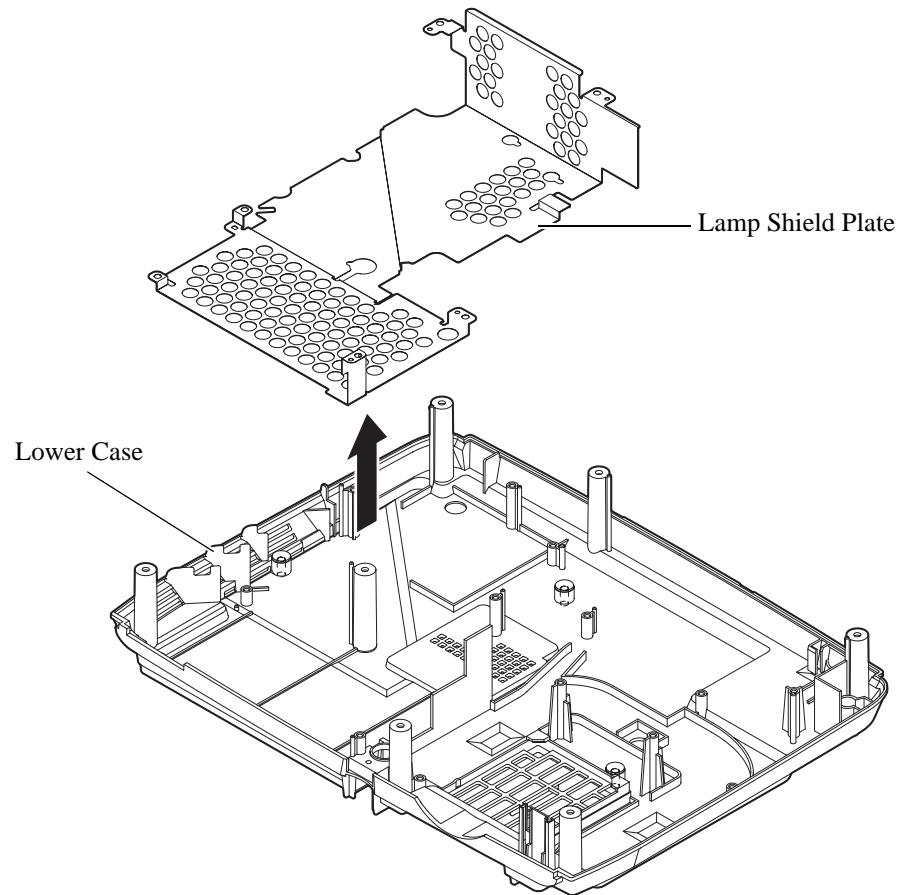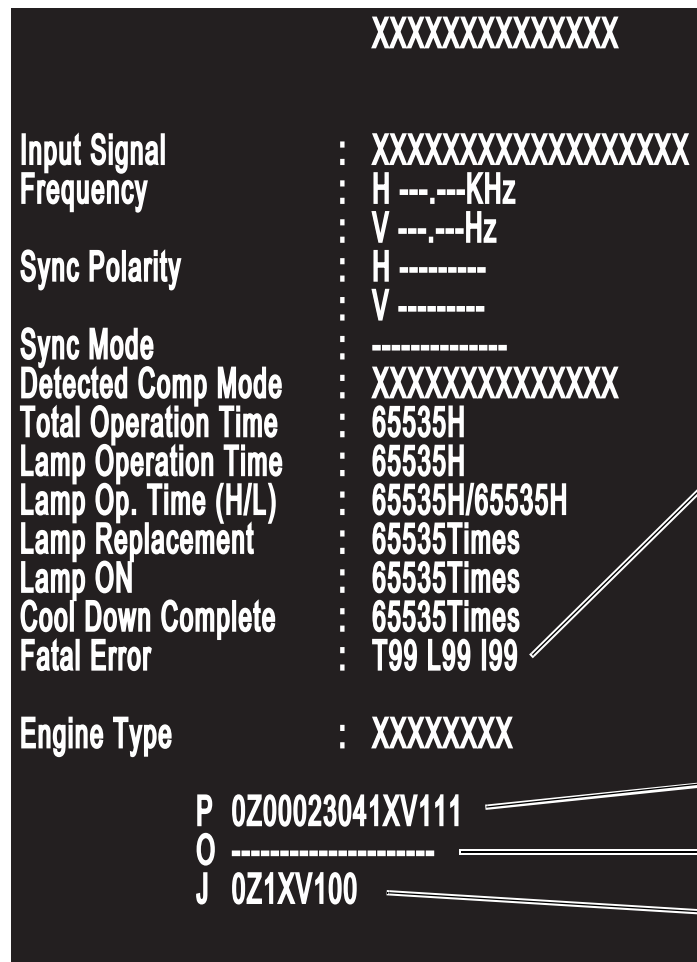
5.1 AS (After Service) Menu

The AS (After Service) menu provides information and settings that are not displayed on the standard menu.

5.1.1 How To Display the AS (After Service) Menu

Press **the Menu** button on either the remote control or the projector's control panel for at least 5 seconds. Within 4 seconds after pressing **the Menu** key, hit these buttons in order shown below to display AS menu.
Esc → Esc → Tele → Wide

■ When the video source is Computer, RGB-Video, YCbCr, YPbPr, the following screen appears.

```
                    XXXXXXXXXXXXX


Input Signal        :  XXXXXXXXXXXXXXXXX
Frequency           :  H ---.---KHz
                    :  V ---.---Hz
Sync Polarity       :  H ---------
                    :  V ---------
Sync Mode           :  --------------
Detected Comp Mode  :  XXXXXXXXXXXXXX
Total Operation Time:  65535H
Lamp Operation Time :  65535H
Lamp Op. Time (H/L) :  65535H/65535H
Lamp Replacement    :  65535Times
Lamp ON             :  65535Times
Cool Down Complete  :  65535Times
Fatal Error         :  T99 L99 I99


Engine Type         :  XXXXXXXX

          P 0Z00023041XV111
          O --------------------
          J 0Z1XV100
```

• Fatal Error: Abnormal termination counter
Displays the number of times of each of the following abnormal terminations.
T: Temperature problem
L: Lamp problem
I: Internal problem
(Same as for S-Video and Video)

The last four digits show the PW firmware version.
The last four digits show the Easy MP firmware version.
The last four digits show the Y43 firmware version.

■ When the video source is S-Video or Video, the following screen is displayed.

```
                    XXXXXXXXXXXXX


Video Signal              :  -----------
                          :  ------------------------
Total Operation Time      :  65535H
Lamp Operation Time       :  65535H
Lamp Op. Time (H/L)       :  65535H/65535H
Lamp Replacement          :  65535Times
Lamp ON                   :  65535Times
Cool Down Complete        :  65535Times
Fatal Error               :  T99 L99 I99

Engine Type               :  XXXXXXXX


          P  0Z00023041XV111
          O  0Z3030WWV100
          J  0Z1XV100
```

The last four digits show the PW firmware version.
The last four digits show the Easy MP firmware version.
The last four digits show the Y43 firmware version.

5.1.2 Initializing (Resetting) the AS Menu Values

There are three levels of initialization that can be used to reset the projector usage history values stored in EEPROM.

1. Clearing the Basic Lamp Information
   While the AS menu is being displayed, simultaneously press the **[Source]** and **[⌐]** keys for 10 seconds.

2. Clearing All the Lamp Information
   While the AS menu is being displayed, simultaneously press the **[Source]** and **[⌐]** keys for 10 seconds.

Item	Clearing the Lamp Information	Clearing All the Lamp Information
Total Operation Time	No Change	Reset to 0H
Lamp Operation Time	Reset to 0H	Reset to 0H
Lamp ON	Reset to 1	Reset to 1
Lamp Replacement	Add 1 to the current value	Reset to 0
Cool Down Complete	Reset to 0	Reset to 0
Fatal Error (3 items)	No Change	Reset to 0
Number of Lights-out (This item is not displayed.)	Reset to 0	Reset to 0

5.1.3 Software DIP Switches

Some software DIP-switch settings are only accessible from the AS menu. To display the DIP-SW Setting Menu, do the following operation.

1. Press **Menu** button on the remote control for at least 5 seconds.
2. Within 4 seconds after releasing the **Menu** button, hit these buttons in order shown below.
   Esc → Esc → Tele → Wide
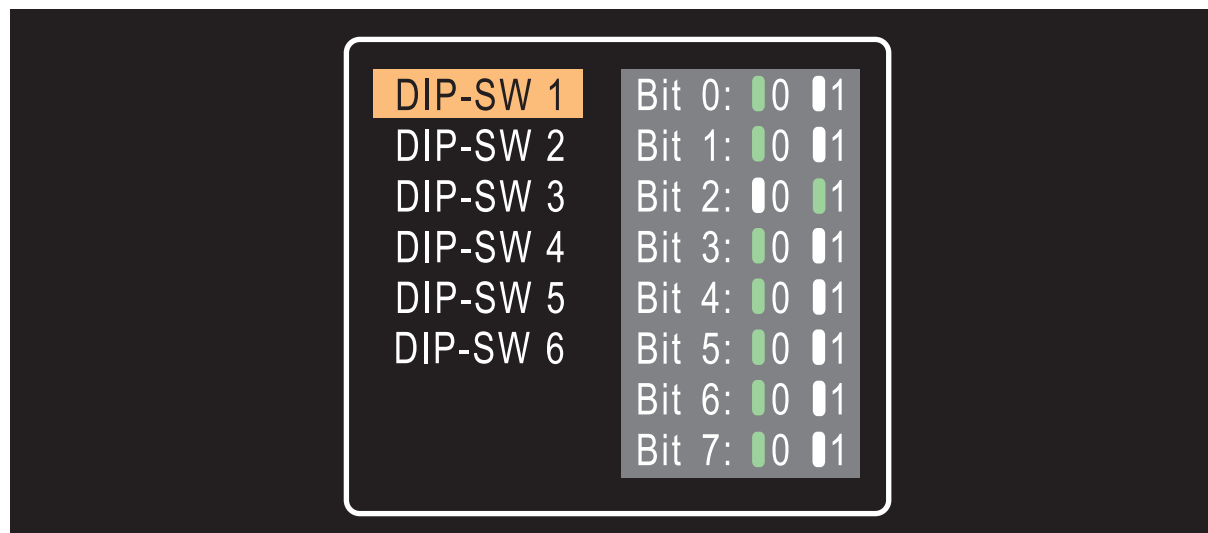   The following sub-menu is displayed.

Switch On or Off, as necessary

DIP-SW No	BIT	Function	Default Setting	Setting Value	Note
SW1	0	(reserved)	-	-	-
	1	Select USB key code	1	0: ↑, ↓, 1: PageUp, PageDown	-
	2	DSR ON/OFF	1	0: OFF, 1: ON	-
	3	E-Zoom ON/OFF at start-up	0	0: OFF, 1: ON	-
	4	(reserved)	-	-	-
	5	(reserved)	-	-	-
	6	Volume gauge display ON/OFF	1	0: OFF, 1: ON	-
	7	(reserved)	-	-	-

DIP-SW No	BIT	Function	Default Setting	Setting Value	Note
SW3	0	Time to sleep mode	0	-	Configurable by 5 minutes, 1-255 minutes Default: 30 Minutes
	1	Time to sleep mode	1	-	-
	2	Time to sleep mode	1	-	-
	3	Time to sleep mode	1	-	-
	4	Time to sleep mode	1	-	-
	5	Time to sleep mode	0	-	-
	6	Time to sleep mode	0	-	-
	7	Time to sleep mode	0	-	-
SW4	0	(reserved)	-	-	-
	1	(reserved)	-	-	-
	2	Lamp noise analysis mode	0	0: OFF, 1: ON	-
	3	(reserved)	-	-	-
	4	(reserved)	-	-	-
	5	(reserved)	-	-	-
	6	(reserved)	-	-	-
	7	(reserved)	-	-	-
SW6	0	(reserved)	-	-	-
	1	Imaging mask ON/OFF when the lamp is on.	1	0: OFF (Displays at once) 1: ON (Displays black background)	Select whether to display black background or to display an image.
	2	(reserved)	-	-	-
	3	Power button ON/OFF when locking the buttons.	1	0: OFF, 1: ON	-
	4	EMP Monitor standby mode ON/OFF	1	0: OFF, 1: ON	-
	5	(reserved)	-	-	-
	6	(reserved)	-	-	-
	7	(reserved)	-	-	-

In order to affect a DIP-SW setting change, turn off the Power button and cool down. The new settings are in effect as soon as cool-down is complete.